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THE ECONOMICS OF AGRICULTURE

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AN INTRODUCTION TO THE
STUDY OF

Agricultural Economics

BY

HENRY C. TAYLOR, M.S.AGR., PH.D.

ASSISTANT PROFESSOR OF POLITICAL ECONOMY IN THE UNIVERSITY OF WISCONSIN, AND EXPERT IN THE OFFICE OF EXPERIMENT STATIONS, UNITED STATES DEPARTMENT OF AGRICULTURE

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THE MACMILLAN COMPANY
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1905

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THE MASON PRESS
SYRACUSE, NEW YORK

To the Memory

OF MY FATHER

TARPLEY E. TAYLOR

WHOSE SUCCESS AS A FARMER, AND WHOSE GENEROSITY AS A FATHER, MADE POSSIBLE THE YEARS OF STUDY WHICH WERE PREREQUISITE TO THE PREPARATION OF THIS BOOK

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AGRICULTURAL ECONOMICS

CHAPTER I

INTRODUCTION

The subject matter of Economics, or Political Economy, is found in the relations arising among men in their efforts to gain a livelihood, and in the relations between man and the physical universe consequent upon these efforts. Economics deals primarily with human relations arising under certain conditions; for example, wages, rent, interest, and taxes, all rest upon such relations. But in order to make a living man must shape Nature to his purposes; therefore we must examine into the given conditions under which men come into contact with each other and with Nature in their efforts to secure the necessaries, conveniences, and luxuries of life.

While she has provided abundant opportunities for producing the means of satisfying human wants, Nature has decreed that man must work, —"In the sweat of thy face shalt thou eat bread."[1] Or to give Vergil's version of the same law,

> The sire of all, great Jove himself decreed
> No works save those that task us should succeed.[2]

Since it is by work that the wants of men are satisfied, it is of general interest that this work shall

[1] *Genesis*, Chapter III, verse 19.
[2] *The Georgics* of Vergil, Book I.

be so directed as to yield the largest possible returns in human satisfaction. Viewed from this standpoint it may be said that economics includes a treatment of "the economy of energy required for the satisfaction of human needs."[1] It is desirable that the energy required for the satisfaction of human wants be used most economically, not that men may work less strenuously, but that they may live more abundantly.

The economics of any particular industry, as agriculture, treats of the principles which should guide those engaged in that industry in the expenditure of energy in the production of economic goods, and also of those institutions which are necessary to impel the promoters of that industry to do that which best conserves the interests of society as a whole.

Agriculture is often spoken of as the most independent of all occupations, and it is true that the farmer is less dependent upon his fellow men than is his city brother. But while it is true that the farmer is brought into contact with other men less frequently than is the merchant or the manufacturer, yet, on the other hand, he is brought into closer contact with Nature. The manufacturer, for example, may know each evening what tasks are to engage his attention the next day, but the farmer simply knows what he would like to do, and awaits the dictations of the weather. So-

[1] P. Kropotkin, *Fields, Factories and Workshops*, p. iv.

cially considered, the farmer may be more independent than the man of the city, but he is certainly more directly dependent upon the conditions set by his physical environment.

But while the farmer may be more directly dependent upon Nature than are those engaged in the industries of the city, he is by no means independent of his fellow men. The pioneer farmer who looked primarily to the satisfaction of the wants of his own household may have selected the crops which he cultivated, without giving any thought to the needs of other men; but the modern agriculturist, who produces primarily for the market, and procures upon the market a large share of the necessaries, conveniences, and luxuries of life, is bound to take into account the demands of his fellow beings. The modern farmer must consider the price for which the produce can be sold as well as the conditions of production, if he would manage his farm successfully.

This close dependence of the farmer upon physical and social conditions which are subject to variation from year to year, makes it impossible for him to manage his work by rule of thumb. He must follow general principles rather than specific rules. He is ever being required to adjust himself to new commercial conditions, and demands are being made upon his judgment many times in the course of each day's work, as he tries to adjust his farm operations to the vary-

ing conditions of soil and climate. It is necessary that the farmer be ever alert. "It is a maxim universally agreed upon in agriculture," says Pliny, "that nothing must be done too late; and again, that everything must be done at its proper season; while there is a third precept, which reminds us that opportunities lost can never be regained."[1] It is of exceedingly great importance that the farmer have in mind some guiding principles which, like the compass, will enable him to direct his actions in accordance with a definite purpose.

There remains that class until this day who fail to recognize the presence of natural laws, and who attribute the unusual success of the men of extraordinary ability to dishonesty or to foul play of some sort, while to "bad luck" they ascribe the results of their own laziness. These men who talk of "luck," and who are not willing to attribute to brain and brawn the success of their neighbors, may well draw a lesson from the following story related by the ancient writer, Pliny: "C. Furius Chresimus, a freedman, having found himself able, from a very small piece of land, to raise far more abundant harvests than his neighbors could from the largest farms, became the object of very considerable jealousy among them, and was accordingly accused of enticing

[1] *Natural History*, Book XVIII, Chapter 8, Bohn's edition, Vol. IV, p. 18.

away the crops of others by the practise of sorcery. Upon this, a day was named by Spurius Calvinus, the curule aedile, for his appearance. Apprehensive of being condemned, when the question came to be put to the vote among the tribes, he had all his implements of husbandry brought into the Forum, together with his farm servants, robust, well-conditioned, and well-clad people, Piso says. The iron tools were of first-rate quality, the mattocks were stout and strong, the plow-shares ponderous and substantial, and the oxen sleek and in prime condition. When all this had been done, 'Here, Roman citizens,' said he, 'are my implements of magic; but it is impossible for me to exhibit to your view, or to bring into this Forum, those midnight toils of mine, those early watchings, those sweats, and those fatigues.' Upon this, by the unanimous voice of the people, he was immediately acquitted."[1]

The element of uncertainty should not be underrated, for this is one of the characteristics of the agricultural industry, and yet it should be remembered that as a rule the chance element is more or less equally great in a given community, and at a given time, for all who are equally intelligent and energetic. The more rational farmers are usually willing to admit that the unusual de-

[1] *The Natural History* of Pliny, Book XVIII, Chapter 8. Taken from the translation of Bostock and Riley, Bohn's Classical Library, Vol. IV, p. 17.

gree of success attained by one of their number is the result of hard work, clear thinking, and skilful management. These more intelligent farmers are coming to recognize that there are fundamental economic principles which, when carefully followed, lead the way to success in agricultural production. The setting forth of such principles is one of the aims of this book.

The development of commercial agriculture has brought the tillers of the soil into close economic relations with those engaged in other industries. The farmer has become dependent upon the manufacturer, the merchant, and the commercial carrier. But besides the relations which arise when the products of the country are exchanged for those of the city, should be mentioned those which are involved whenever labor is employed, and whenever the use of land is acquired either by lease or by purchase. These various relations often result in conflicting interests which must be adjusted by public authority in accordance with some generally accepted principle. Hence it has come about that these economic relations have their legal side. So to analyze the conditions of agricultural production that those who make the laws, which are intended to adjust the economic relations of those engaged in this industry, may act intelligently, is, therefore, another purpose which has been held in mind in the preparation of this work.

CHAPTER II

THE FACTORS OF AGRICULTURAL PRODUCTION

While the natural agents, heat, light, air, moisture, and the soil, are all essential to agricultural production, the farmer usually acquires the use of all these when he buys or rents land, and for this reason economists have commonly included all these natural agents under the one term *land*. Horses and other live stock, tools and machinery, buildings, and general farm supplies are also essential to modern agricultural production. These, so far as they are used for productive purposes, are classed together as *capital-goods*. The term *capital* has been used by economists in the sense in which we here use the term capital-goods, but it often happens that these writers have in mind the money value of certain instruments of production rather than the concrete things such as horses, cattle, sheep, and hogs, or barns, plows, harrows, drills, and reapers, or hay, grain, and fodder which are fed to productive animals. The farmer deals with concrete things. As the term land is used to designate something concrete, so the term capital-goods will be used in this book to designate certain other concrete

things. The term *capital* will be used at times to designate the money value of capital-goods.

In order that the land and the capital-goods shall be most productive it is necessary that man should do his part. The work required for this, whether intellectual or physical, and whether performed by the farmer himself or by hired men, is, in most economic literature designated by the term *labor*.

The activities of man as a factor in agricultural production may be divided into two classes: first, management, which includes that activity which is requisite to the planning and supervision of the operations of the farm; and, second, the performance of certain tasks, such as plowing, sowing, harrowing, etc., as directed by the manager. The latter is usually called "labor," which is the narrower and more common use of this term. Both of these functions, labor and management, are commonly performed by farmers in this country, although to hire laborers to perform many of the operations of the farm is also common. For many purposes it seems more convenient to follow the practise of using the term labor in its inclusive sense, and yet for certain purposes of analysis it is necessary to make the distinction between labor in this narrower sense and management.

These three, land, capital-goods, and labor, or man as a manager and as a laborer, are called *the*

factors of production. These factors being the basis of agricultural production, we shall first consider the abundance and economic character of the land and the capital-goods employed in agriculture, and the number and economic character of the men engaged in this industry, in the United States, and then attempt to lay down the principles in accordance with which these factors should be organized.

Section I. Land. — The land area of the United States, exclusive of Alaska and the insular possessions, was given, in 1900, as 2,970,230 square miles, or 1,900,947,200 acres. The acreage in farms was given, as 838,591,774, which is about forty-four (44.1) per cent. of the total land surface of the country.[1] Of the total area included in farms, however, only about half (414,498,487 acres, or 49.4 per cent.) is given as improved land.[2] Hence only about twenty-two per cent. (21.8) of the land area of the United States is improved farm land. It is interesting and helpful to compare the United States with some of the European countries in this regard. In England seventy-six per cent. of the total area is

[1] Twelfth Census of the United States, *Statistical Atlas,* pp. 25 and 70.

[2] Under the total area in farms is included "all outlying or separate meadows, pastures, woodlots, marshes, etc." Under "unimproved land" is included all "land which has never been plowed, mowed, or cropped, including land once cultivated but now grown up to trees and shrubs." Under "Improved land" is "included all land not reported as unimproved." (Twelfth Census of the United States, Vol. V, p. 758.)

given (1900) as the improved area of farms.[1] In Germany, eighty per cent. of the total area is included in farms (1895); but only three-fourths of the total farm area is counted as improved land. Hence about sixty per cent. only of the total area of Germany is improved farm land.[2] These figures indicate that the land of the United States has not been nearly so completely brought under cultivation as has that of the older countries. Yet there is sixteen times as much improved farm land in the United States as there is in England, and five times as much as in Germany.

The above figures for the United States as a whole do not fairly represent the extent to which the land of this country has been utilized. In the state of Illinois ninety-one per cent. of the total area is included in farms, and eighty-four and one-half per cent. of the area in farms is improved, so that nearly seventy-six per cent. of the total area of the state is improved farm land. In Iowa the proportion of improved land is even

[1] By "improved area" is meant the acreage under "crops, bare fallow, or grass," "the rough grazings attached to many farms in hilly districts" not being included. The total "improved area" of farm land in England was 24,713,790 acres. (See the *Agricultural Returns,* published annually by the Board of Agriculture.)

[2] Land used as cultivated fields, gardens, meadows, rich pastures, orchards, and vineyards are counted as improved land, in the German reports. The total improved area in farms in Germany was 80,451,632 acres, in 1895. (See *Statistik des Deutschen Reichs* (1895). Neue Folge 112, p. 21*)

larger. Ninety-five and eight-tenths per cent. of the total area of that state is farm land, and of that in farms eighty-six and one-half per cent. is improved, so that eighty-three per cent. of the total area of the state is improved farm land. In Wisconsin the situation is quite different. Only fifty-five and five-tenths per cent. of the total area is there included in farms, and only fifty-six and six-tenths per cent. of that is improved, so that only thirty-one and four-tenths per cent. of the total area of the state is improved farm land. It is well known that this low percentage of improved land in Wisconsin is due to the vast areas of unoccupied land in the northern part of the state. The figures for New Mexico will help one to understand why the percentage of improved land for the United States as a whole is so low in spite of the fact that some states surpass the densely populated European countries in the percentage of their improved land. In 1900, only five and nine-tenths per cent. of the total area of New Mexico was in farms, and only six and four-tenths per cent. of that was improved. Thus the improved area was only thirty-eight-hundredths of one per cent. of the total area.

Of the territorial divisions of the United States, the North Central States form by far the most important agricultural region. While these states contain only about one-fourth of the total area, they contain more than one-half of the im-

proved land of the United States (1900), and, in 1903, they produced over two-thirds of our maize, wheat, and barley crops and nearly three-fourths of our oat crop.

It is true that vast areas of the unimproved land of this country are not capable of being brought under cultivation, yet there is certainly a much greater opportunity for agricultural expansion here than in Europe. It would be interesting to know what share of the unimproved areas of the United States might be cultivated. It is certainly true that much of the land included in the "unimproved area" of farms might be plowed or mowed if this form of treatment would bring larger net returns to the farmer than he can obtain in other ways. Our rich pasture lands, which produce an enormous amount of wealth each year with a minimum expenditure of labor, are included under the head of unimproved land. The area which is not included in farms consists, in part, of timber lands which form the basis of the lumber industry, and, in part, of valuable grazing lands which supplement the farms in the production of meat and wool.

Irrigation is proving an important means of extending agriculture in the arid regions. To quote Professor Elwood Mead: "The uninhabited and mismanaged areas of the arid region are full of opportunities. A realization of the possibilities of this region and of what man can accom-

plish by a right use of its resources has been of slow growth. To the early fur traders and explorers the arid region was a dreary, worthless waste. To neither Bonneville, Fremont, nor any of the multitude who crossed its vast expanse to reach the golden rivers of California was there given any prophetic vision of the magic to be wrought by irrigation. Nor is this surprising. It is difficult to imagine anything less attractive than the stretches of barren sand broken only by the isolated yuccas of the Mojave Desert, or anything more dreary than the crucifixion thorn of Arizona. Only in localities where the work of reclamation has been in progress long enough to permit the growth of trees, flowers, and shrubs, can the possibilities of the soil and climate be appreciated. No greater contrast can be found anywhere than is afforded by a comparison of the desert above the ditches and the cultivated fields below them. . . . The arid West is the nation's farm. It contains all that is left of the public domain, and is the chief hope of those who dream of enjoying landed independence, but who have little beside industry and self-denial with which to secure it. As it is now, this land has little value. This is not because the land lacks fertility, but because it lacks moisture. Where rivers have been turned from their courses, the products which have resulted equal in excellence and amount those of the most favored district of am-

ple rainfall." And yet, with respect to the proportion of these arid regions which may be made productive, the same authority gives the following rather discouraging estimate: "If every drop of water which falls on the mountain summits could be utilized, it is not likely that more than ten per cent. of the total area of the arid West could be irrigated, and it is certain that, because of physical obstacles, it will never be possible to get water to even this small percentage."[1]

The introduction of new varieties of grains and forage crops which are suited to semi-arid regions makes possible the extension of agriculture where the rainfall is too light for the crops which are commonly grown in the humid regions. For example, the drought-resisting macaroni wheats have recently been introduced with great profit. "In many places west of the 100th meridian, where wheat growing with other varieties is practically impossible on account of drought, the eastern Russian varieties by virtue of their extreme drought-resisting qualities will produce, ordinarily, a crop of from twelve to twenty bushels per acre. By the use of these wheats, therefore, these localities may become important additions to the wheat area."[2]

The growth of our population is sure to make increasing demands upon the agricultural re-

[1] *Irrigation Institutions*, pp. 2, 3, and 5.

[2] United States Department of Agriculture, Bureau of Plant Industry, *Bulletin, No. 3*, p. 28.

sources of the country, a part of which may be met by extending the industry into regions which are not being used; but the most important means of increasing the supply of agricultural products in the future will doubtless be by farming more intensively the land which is already in use. This means that the part which labor and capital-goods play in agricultural production will be more important, relatively, in the future than at the present time.

Section II. Capital-Goods.—According to the census for 1900, the implements and machines on the farms of the United States were valued at 761,261,550 dollars, which is an average of ninety cents per acre of farm land. The value of live stock on farms was given at 3,078,050,041 dollars, or an average of three and sixty-six-hundredths dollars per acre of farm land. Together, therefore, the value of the live stock, tools and machinery amounted to four and fifty-six-hundredths dollars per acre. But these figures do not fairly indicate the amount of capital required to operate a farm in this country. To this must be added the money which the farmer is required to have in hand for meeting current expenses, the value of the grain, hay, etc., which he has in store at the time when the valuation of the live stock is made, and the many little things which are necessary and yet which are usually omitted from the census valuations.

A concrete example is worth more than abstract averages in giving a correct notion of the amount of capital a tenant farmer must have in order to carry on agriculture successfully.

On March 1st, 1904, an invoice was made by disinterested men, of all the live stock, grain, and fodder on a farm in southeastern Iowa. The farm consisted of six hundred acres of land, two hundred and ninety-five acres of which were plowed or mowed land at the time. The remainder was in pasture, though some of the land then in pasture had been and will again be under the plow, while parts of the pasture land are densely covered with trees. On the whole the degree of intensity of culture is about the average for that part of the country, which is certainly far from being farmed intensively. The land had been farmed "on shares," one party furnishing the land and half of the live stock and bearing half of the expense when live stock or feed was purchased. The other party furnished half of the live stock, all of the tools and machinery, and the labor needed to operate the farm. When the invoice was made for the purpose of bringing this partnership to a close, the live stock, grain, hay, etc., were valued at about five thousand dollars. This is eight and one-third dollars per acre. The live stock was of the ordinary breeds commonly kept in that part of the country. The farmer estimated the value of the tools and

machinery on the farm at six hundred dollars, though if all of it had had to be purchased new, it would have cost more than twice that amount. This indicates that more than nine dollars per acre was required, to enable the farmer to assume the ownership of all of the live stock, grain, fodder, tools and machinery on the farm on March 1st. To this, no great amount would need to be added for bills which had to be met before the farm could be made to yield a return, for the farm was in full running order, with sales occurring every few weeks.

The amount of capital required for carrying on agriculture in the principal European countries is much greater than the amount commonly used in this country. In England, the better farmers invest forty dollars and more per acre. This includes, of course, all the capital that a tenant farmer must be able to command in order to carry on agriculture successfully. The advanced rent, the advanced wages of labor, the cost of living until returns can be had, as well as the value of the live stock, machinery, etc., are all included in this amount.

The amount of capital invested, per hectare of land, in German agriculture has greatly increased in the last hundred years. Early in the Nineteenth Century, according to Albrect Thaer, the investment of 168 marks[1] per hectare[2] was

[1] A mark is worth 23.8 cents.

[2] The hectare is equal to 2.471 acres.

counted intensive agriculture, whereas at the present time more than six hundred marks per hectare are sometimes invested. The following figures have been given to represent the amount of operating capital per hectare required to carry on agriculture in Germany. The amount varying in the different parts of the country and in the different lines of production.[1]

Very intensive farming.....more than 600 marks per hectare
Intensive farming....between 400 and 600 marks per hectare
Medium intensive farming " 300 and 400 marks per hectare
" extensive " " 200 and 300 marks per hectare
Extensive farming .....under 200 marks per hectare

While these figures for the amount of money invested per acre, in agricultural production, in European countries are not exactly comparable with those for the United States, it is clear that our agriculture is much less intensive than that of Germany and of England.

Section III. Population. — The aggregate population of Continental United States in 1900, was 75,994,575. Of this total thirty-eight and four-tenths per cent. were engaged in gainful occupations. Of all persons ten years of age and over, fifty and three-tenths per cent., or 29,285,922, were engaged in gainful occupations. Of the male population ten years of age or over, eighty per cent. were engaged in gainful occupations; while only eighteen and eight-tenths per

[1] Prof. Dr. Werner, Berlin, *Der Betrieb der Deutschen Landwirtschaft*, p. 74.

cent. of the female population were so engaged. These were distributed among the different pursuits as follows:

	1900	1890	1880
Agricultural pursuits	35.7%	37.7%	44.3%
Professional service	4.3"	4.1"	3.5"
Domestic and personal service	19.2"	18.6"	19.7"
Trade and transportation	16.4"	14.6"	10.7"
Manufacturing and mechanical pursuits	24.4"	25.0"	21.8"

There were 10,438,219 persons engaged in agriculture in 1900. Of these 5,681,257, or fifty-six per cent. were farmers, planters, and overseers; 4,459,346 or forty-four per cent. were agricultural laborers. Of these "agricultural laborers" more than half (2,366,313) were members of the farmers' families, and less than half (2,047,658) were hired laborers, so there was scarcely more than one hired farm hand, on the average, for every three farmers. This means that in the vast majority of cases the work of the farm is done by the farmer and his family; there being many large farms on which large numbers of hands are hired, as for example on wheat farms, on sugar plantations, and on the large grain and stock farms where the farmer is little more than a superintendent and does not put his own hand to the plow. Under "agricultural pursuits" are included, besides the above, the following classes:

Dairy men and dairy women	10,931
Gardeners, florists, nurserymen, etc	62,418

Lumbermen and raftsmen	72,190
Stock raisers, herders, and drovers	85,469
Turpentine farmers and laborers	24,737
Woodchoppers	36,265
Other agricultural pursuits	5,606

There were forty-one acres of improved land in the United States in 1900 for every person engaged in strictly agricultural pursuits. In England there is a little over eight acres of improved agricultural land for each person engaged in agriculture. In Germany one person is employed in agriculture for every ten acres of improved agricultural land. Much work is done by hand in European countries that is done by machinery in America. In Germany, for example, only about one farm in six had any machinery (*i. e.*, as distinguished from tools) used upon it in 1895. It is the great number of small farms that makes the percentage so low. Most of the large farmers used some machinery, and yet scarce a third of these farmers employed mowing and reaping machines.

A better test of the relative intensity of culture of the various countries is the number of bushels per acre which they produce of the same grain. For the year 1902 the average production of wheat in the United States was 14.5 bushels per acre; in Germany, 23.5; in England, 31.9 bushels. For the same year the average production of oats in the United States was 28.7 bushels per acre; in Germany, 44.9; in England 41.5 bushels,

whereas the natural fertility of the soil of the United States is superior to that of these European countries.[1]

Thus it seems that, compared to European countries, we use a small percentage of our total area as farm land, we expend a small amount of labor and capital per acre, and we win a small product per acre; though our product is larger (in quantity at least) per capita of those engaged in the industry than that of the older countries.

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[1] See *Bulletin No. 22,* U. S. Dept. of Agriculture, Office of Exp. Station, p. 166.

CHAPTER III

THE ECONOMIC PROPERTIES OF THE FACTORS OF PRODUCTION

Section I. The economic properties of land as a factor in agricultural production.—It is a familiar fact that land is essential to all forms of economic activity. Manufactures and commerce cannot be carried on without the use of land. These industries use land, however, primarily as standing-room. The character of the soil is of little or no significance to the man who wishes to use land simply as standing-room for a cotton factory. In the case of agriculture, conditions are quite different. To the farmer, land is valuable not only because it provides space for buildings and roads, and for the performance of such work as the threshing of grain, and the feeding of cattle; it is valuable to him first of all because of those physical and chemical characteristics of the soil and the atmosphere which make the land capable of supporting plant life.

Under the physical conditions which are conducive to plant growth are included: (1) the moisture and (2) the temperature of the soil

and the air, and (3) the mechanical structure of the soil. The amount of rainfall and sunshine remaining the same, the moisture and the temperature of the soil, and its capacity for retaining the chemical elements of fertility vary greatly from place to place because of differences in the size of the particles of the soil. By cultivation the soil may be improved to some extent, in this respect. By drainage and by irrigation the moisture of the soil can be modified, and by the use of glass and artificial heat the temperature of both the soil and the atmosphere can be regulated. But in most places and for most purposes Nature has done infinitely more for man than he can do for himself in providing the land with these desirable physical qualities.

From the standpoint of the economist the most important chemical conditions of plant growth are: (1) nitrogen, (2) phosphoric acid, (3) potash, and (4) water. Other chemical compounds contribute to plant growth, but these are the ones which require our especial attention because they are present in the soil in limited and varying quantities, and because they are more or less readily exhausted and require considerable effort to increase or replenish their supply. In the humid regions where the water needed by plants is abundantly supplied by Nature this element of fertility requires little or no attention, but in the arid regions water ranks first in eco-

nomic importance. The carbon dioxide gas of the air is as important to plant growth as is water, but it is present in such great abundance that it has no value placed upon it and hence does not enter into the list of economic conditions which require our attention.

All of these physical and chemical conditions of plant growth are usually included under "the fertility of the land."[1] And as it varies greatly with respect to these conditions, land is said to vary from place to place with respect to its fertility.

When a man contemplates the purchase of a farm there is one thing more which is of vital importance to him. He wants extent of land and he wants this land to be fertile, but what is sometimes even more significant than these qualities is the *location* of the farm which he is to cultivate. In fact the physical and chemical characteristics of the land are greatly influenced by its location. Heat and moisture, and the character of the rocks from which the soil is formed vary greatly from place to place. But besides these variations in the natural conditions, there are variations in the social conditions which influence the production and sale of products. Large populations are in some places concentrated on small areas, leaving vast territories sparsely settled. This variation in the density of population may

[1] I. P. Roberts, *The Fertility of the Land*, p. 9.

be explained, in part at least, in terms of variations in the physical environment, but our especial interest is in the effect and not the cause of this variation in the density of population. Where the population is dense capital is also usually present in great abundance, and can be had more cheaply than in the sparsely settled districts. This abundance of labor and capital enables the farmer to operate his land more cheaply. But this is not all. The farmer who is nearer a great center of population, such as London or New York, can sell his products for the same price which is paid for like products which have been shipped great distances. Thus it is that of two pieces of land equally fertile the farmer prefers the one located nearer a great center of population, because it enables him to produce and market products more cheaply.

Because of these variations with respect to fertility and location, land is said to vary in productivity, or, in its value-producing power. That is, a given farmer, employing a given amount of labor and capital-goods of a specified grade, can obtain larger gross receipts upon one piece of land than upon another of the same area.

The words "fertility" and "productivity" have commonly been used synonymously to designate the relative number of bushels or pounds of product obtained from a given area of land. But the one common property of economic goods is

value. Economic goods have weight and bulk, it is true, but these properties they share in common with free goods. We need therefore some term which will express the relative capacity of different pieces of land to produce values, and since it is bad economy to use two words for one idea and leave another idea without any word with which it may be expressed, it is desirable that a more equitable distribution of words should be made. Fertility refers to the quality of the land. Variation in fertility is measured in terms of the pounds or bushels of the product. Instead of using the word productivity to designate this same idea we propose to use this term to designate the relative value-producing-power of the land. The productivity of land may, and usually does, vary from place to place because of variations in the fertility of the land and because of differences in location with respect to the central market. Differences in the productivity of land due to location may be expressed in terms of variations in the local market prices of the products.

Because of the fact that land is limited in quantity, some economists have said that land partakes of the character of a monopoly. This statement is rather misleading, however, for the essential element in a monopoly is unity of control, and land does not lend itself readily to unity of control. What these economists have in mind is that land usually commands a price which is

greater than the cost of improving such land. This higher price is due, however, to the fact that productive land is relatively scarce. Land of a given grade may have a value placed upon it far above what it costs to bring such land under cultivation; but this is due to the limited quantity of productive land and as this scarcity is not due to the control of man but to the nature of the physical universe, land should not be called a monopoly good.

Section II. The economic properties of capital-goods as a factor in agricultural production.— The capital-goods, such as horses, cattle, machinery, and buildings which are used in agricultural production, differ from land in that they can be increased in quantity indefinitely. It is true that effort and sacrifice are essential to the production of capital-goods, but with the growth of wealth and the progress of industrial society, less and less sacrifice is required in order that the supply of capital-goods may be increased or improved.

So far as location is concerned many forms of capital-goods are movable, so that they can be taken to the place where they best serve the purpose for which they were intended. While some forms of capital-goods cannot easily be moved after they are once constructed, they can be made where they best serve the purpose of the farmer. Hence, while the productivity of land is greatly influenced by location, the location of capital-goods

is determined largely by their opportunities for productivity. And yet all forms of capital-goods vary in productivity. Some machines are better than others which were intended to do the same kind of work. The grain binder, for example, is more useful than the old self-rake, and some binders do better work than others. Some horses will do more work or in some other way be more productive than others. Certain breeds of cattle, sheep, or hogs will convert the food given them into more valuable products than other breeds. Hence, other things being equal, the man who works with the most productive forms of capital-goods can produce the largest returns.

This variation in the productivity of capital-goods is apt to be overlooked, because capital-goods are valued according to their productivity, and when we speak of the amount of capital employed upon a given farm we have in mind the *value* of the capital-goods, and of course one dollar's worth of capital-goods under the same management should be just as productive as any other dollar's worth.

While variation in productivity is common to both, there is an important difference between land and capital-goods, in that when more capital-goods are wanted it is usually the more productive forms which are made, while an increase in the amount of land under cultivation usually requires that less productive land be resorted to. The

history of agriculture in the United States shows that changes in the character of the capital-goods and especially of the machinery has greatly influenced the usefulness or productivity of this factor of production.

"The year 1850 practically marks the close of the period when the only farm implements and machinery, other than the wagon, cart and cotton-gin, were those which, for want of a better designation, may be called implements of hand production. The old cast iron plows were in general use. Grass was mowed with the scythe, and the grain was cut with the sickle or cradle and threshed with the flail. . . . The last half century has witnessed a revolution in agricultural methods, and the new implements and machines introduced would require more than a page to catalogue."[1] "For the United States the value of machinery per acre of farm land has increased nearly eighty per cent. since 1850. . . . These increases in money value, however, do not measure the added usefulness of the new machinery. This is measured principally by the degree to which the machinery saves human labor by substituting the power of animals or of steam."[2]

"The number of acres of the leading crops per male worker increased from 23.3 in 1800 to 31 in 1900. The number of acres of these crops per

[1] Twelfth Census, Vol. V, p. xxix.
[2] *Ibid.*, p. xxxi.

working animal was 13.5 at both of these dates; but the average number of horses to one male worker increased from 1.7 in 1880 to 2.3 in 1900." From these figures it appears that in the last twenty years, by the aid of machinery, and the substitution of horse power for hand labor, the effectiveness of human labor on farms has been increased to the extent of about thrity-three per cent. "The special investigations of the Labor Bureau have led to the conclusion that by the use of machinery the effectiveness of human labor has been nearly, if not quite, doubled since the middle of the century."[1]

While the percentage of the population of the country which was engaged in agriculture declined 8.6 per cent. during the two decades from 1880 to 1900, the production of the staple food crops per capita of the total population about held their own. This is shown by the following figures:[2]

		1880	1900
Wheat	bu. per capita	9.16	8.66
Corn	" " "	34.98	34.94
Oats	" " "	8.13	12.40
Potatoes	" " "	3.38	3.60
Cattle	head per capita	.72	.69
Hogs	" " "	.95	.83
Sheep	" " "	.70	.52

[1] Twelfth Census, Vol. V., p. xxxi.

[2] United States Department of Agriculture, Division of statistics, *Bulletin No. 24.* Relations of Population and Food Products in the United States, pp. 20, 24, 30, 38, 57, 65, 70.

The above figures indicate also that while the grain crops and the potato crop about kept pace with the increase in the total population in spite of the fact that the share of the population engaged in agriculture decreased greatly, the production of live stock did not increase so rapidly as did the total population. And yet, in the case of live stock there has been an important improvement in the breeds which would, in part at least, make up in increased size and value per head for the decline in the number per capita. It is certain that in those lines of production in which new forms of machinery have been introduced the effectiveness of labor has been greatly increased because of the higher degree of productivity of these new forms of capital-goods.

Section III. The economic properties of labor as a factor in agricultural production.—There is no limit to the increase in the number of laborers except that set by the limited character of the other factors of production. The English economist, Malthus, called attention to the fact that population *tends* to increase at a geometrical ratio, that, as population increases, it becomes necessary to resort to less and less productive land, where, if improvements are not made in the methods of cultivation, it becomes more and more difficult to make a living. It is this strong tendency on the part of mankind to increase in numbers, along with the desire of most individuals to

live better than they do at present, that is the most powerful dynamic factor in industrial society.

The population of the United States has increased very rapidly in the last hundred years. The population was 5,308,483 in 1800, and in 1900 it was 76,303,378. The territory of the United States expanded in the mean time it is true, but not so rapidly as did the population. The number of inhabitants per square mile was 6.6 in 1800, and had risen to 25.6 in 1900. This means that the land resource of the United States is rapidly being occupied, and it is a fact often commented upon in recent years that the best land is now all in use, so that as the population increases more and more ingenuity will be required to make the soil provide sustenance for the increasing numbers. This has already resulted in efforts to increase the available area of agricultural land by means of drainage and irrigation, and in efforts to make each acre of land yield a larger product by means of a more intensive culture. In general it would seem, therefore, that the propensity on the part of human beings to increase in numbers tends to be transmuted into an improvement in the quality of the labor supply.

The labor of all those who are engaged in agriculture is not equally productive. This is due to variations in the *efficiency* of those engaged in this industry. There are more than five million farm-

ers in the United States. From general observations we know that some of these farmers can scarcely make a living, others live comfortably and gradually save enough to buy a small farm, while still others are very prosperous, living well and accumulating considerable sums of money from year to year. The relative degree of prosperity to which the American farmer can attain is determined largely by his own efficiency.

The variation in the efficiency of the farmers may be either qualitative or quantitative. Qualitative efficiency refers to the return which a man can produce upon a given piece of land with a given supply of capital-goods. Quantitative efficiency refers to the quantity of land and capital-goods which a man can operate. When two farmers employ equal amounts of labor and capital-goods upon equal areas of equally productive land, the one who possesses a relatively high degree of qualitative efficiency can produce a larger return than his competitor who is qualitatively less efficient. The larger return is won by the farmer who is qualitatively more efficient because he shows greater skill in performing his work. He uses better judgment in planning his farm operations, in regulating his field system, in selecting seeds, in choosing tools and machinery with which to do the work, or in the breeding and feeding of live stock. The farmer who is quanti-

tatively the more efficient can do more work of a given quality.

With respect to the efficiency of the farmers of the United States we may say, from general observation, that they are more alert and do *more* work than do the farmers of England,—they are quantitatively more efficient; but it seems true also that they are not in the habit of doing their work so carefully,—they are qualitatively less efficient. This difference is doubtless due in part at least to the fact that extensive culture has generally been most profitable in America, while intensive culture has long been necessary in Europe. In England, keen competition for the use of land has weeded out the farmers who could not produce a large surplus over costs on each acre of land, while in the United States this class has been able to compete more successfully. At the present time, however, the competition for the use of land is becoming keen in this country, and in the future the farmer who does not plan his work carefully and do it well, is sure to find it more and more difficult to pay the price which his competitors are offering for the use of land.

One element of our agricultural population is markedly inefficient, both from the standpoint of the quantity and the quality of their work. In 1900, thirteen per cent. of the farms of the United States were operated by negroes. In the South Atlantic States the percentage of negro farmers

was thirty, in the South Central States it was twenty-seven and two-tenths, while in the one state of Mississippi the percentage was fifty-eight and three-tenths. The size of their farms is small,—averaging about fifty-one acres. That they do not work very strenuously nor compete very keenly for the use of land, is shown by the fact that land of practically the same grade is much less valuable in Alabama where the negroes predominate than in Texas where the whites are in the majority. In all of the thirty-nine counties of the "Black Prairie" of Texas the whites were in the majority in 1890, and the average value of land was 12.19 dollars per acre; whereas, similar soil was worth 6.40 dollars per acre in the "Black Prairie" of Alabama in which there are twelve counties, and in all of which counties there were more negroes than whites.[1]

A Southern planter, interested in the improvement of the negroes, is quoted as saying: "One of the things which militates most against the negro is his unreliability. . . . His mental processes are past finding out and he cannot be counted on to do or not to do a given thing under given circumstances."[1] "Judged by present standards," says Carl Kelsey, "the negro is decidedly lacking. . . . Something *is holding him back*, ...

[1] Carl Kelsey, *The Negro Farmer*, p. 69; also, Harry Hammond, in *The Cotton Plant (Bulletin No. 33*, U. S. Dept. of Agr., Office of Experiment Stations), p. 242.

it is his inheritance of thousands of years in Africa."[1]

Thus a review of the economic properties of the factors of production shows them to be alike in that they vary in productivity. This variation in productivity is a fact that must ever be kept in mind in any discussion of the organization of the factors of production. On the other hand it has been found that land is very different from the other factors of production with respect to its capacity for being increased in quantity. This fact becomes important in explaining why the organization of agriculture must ever be changing with the progress of society.

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CHAPTER IV

THE GUIDING PRINCIPLE IN THE ORGANIZATION OF THE FARM

There was a time when each farm family or each small community tried to produce for itself all the food, clothing, and shelter necessary to its well-being,—each family carried on both agriculture and manufactures. This was the ideal in western Europe in the days of Karl the Great, and it has not been long since it was the ideal of the pioneer farmer in America. But with the modern organization of industrial society, men have found that a given amount of economic activity will produce the means of satisfying a greater number of wants when each man devotes himself more or less exclusively to some one line of production. This specialization in production brings larger returns because (1) some parts of the world are especially well suited for the production of certain products, (2) some men are especially well fitted for performing one kind of work while others can best do something else, and (3) any man can accomplish more when he devotes all of his time and attention to one kind of work than when he changes about indefinitely

from one thing to another so that he never acquires a high degree of skill in any line, to say nothing of the loss of time in making changes.

As a result of the development of commerce in the products of agriculture, the modern farmer has found it profitable to look primarily to the production of a few staples which can be put upon the market in exchange for the great variety of things which he desires to use. Incidentally many modern farmers produce certain articles, such as fruits and vegetables, primarily for the use of their own households, and here they are free to follow their own instincts, as did the self-sufficing farmers of olden times, and produce those things which they like best to consume; but in the production of the staples of commerce they must, if they would best succeed, produce those things which will enable them to obtain upon the market the largest possible means of supplying their wants, in return for every unit of effort which they expend upon their farms.

From the point of view of the farmer, then, the first problem before us in the economics of agriculture pertains to the selection of land and the management of a farm in such a manner as will enable the farmer, one year with another, to win the largest net profits. For example, if a farmer is operating land in a given community he should endeavor to determine which grade of land to cultivate, which kinds of crops to grow, how in-

tensely the land should be cultivated in the case of each crop, and how large a farm he should attempt to operate in order that, after he has counted out the rent of the land (or the interest on the value of the land and the cost of repairs, etc., if he owns the land), the expense (in the forms of interest and wear and tear) to which he has been for the use of capital-goods, and the cost of hired labor, the total net profit which is left to him and his family in return for their own labor, skill, and enterprise shall be as large as possible.

We find it desirable in this treatise to look upon the farmer and his family as a unit, and to use the phrase "net profit" to designate that share of the entire product of the farm, which is attributed to the personal services of the farmer and his family. It is not essential that the net profit be in the form of money, a portion of it may well be retained in the form of commodities which may be used directly by the family. The articles so used have their value quite as clearly as do those which are sold. In speaking of the farmer's net profit, therefore, the value of the products retained for home consumption should be included.

From the standpoint of economy in production, the modern system which is called commercial agriculture, is without question, far superior to the old self-sufficing system, for it undoubtedly enables the farmers to win a larger net profit; but from the standpoint of justice in distribution,

the commercial system has been challenged, and there is doubtless a chance for improvement in this regard. To illustrate the way in which this injustice may arise, let us suppose that a given farmer puts forth a given amount of labor and capital in the production of goods which he sells upon the market for one hundred dollars; and suppose also that when this money is invested in the various articles which he wishes to consume the farmer finds that the commodities which he is taking home in return for the products of his farm, were the product of much less, say twenty per cent. less, labor and capital than the amount which he expended upon the commodities which he took to the market, and that this difference is due to the fact that some men have a power of absorbing much of the profits of labor by simply manipulating values without adding anything to the usefulness of commodities. Certainly if such a condition existed it would be an injustice to the farmer even though the articles which he received in this way would satisfy many more wants and satisfy those more completely than he could hope to satisfy them if he tried to produce for himself every article which he consumes.

It has been alleged that there are men who do no work, but simply sit at certain points where exchanges are made and demand that their baskets be filled.[1] To avoid this alleged injustice in

[1] Wilbur Aldrich, *Farming Corporations*, p. 169.

the distribution of wealth, it has been proposed[1] that "Farming Corporations" be organized, and that these corporations make it their business to produce for themselves everything they want to use. It is proposed that no attention shall be paid to the commercial world nor to commercial values, but simply to the wants of the farmers and their families. Every kind of agricultural product which may be desired for use by the members of this corporation is to be produced by them. Wool is to be produced and converted into clothing, beef is to be produced for home use, and the hides of the animals converted into shoes for home use. Thus to avoid unjust treatment it is proposed to throw away the advantages of the commercial system and revert to the old self-sufficing system in agricultural production.

Mr. L. H. Kerrick, of Bloomington, Illinois, a leading and successful farmer of that state, delivered an address at the Iowa Agricultural College, Ames, Iowa, a year or more ago, in which he said in part:

> The farmer has, in my region certainly, become too much imbued with the spirit of commercialism. He has gone too far, I think, in the way of producing things to *"sell."* He raises big crops of corn and oats to sell, or feeds many cattle and hogs for the market. He sells these at the other fellow's prices. Then he turns about and buys at the other fellow's prices, supplies of various kinds that he might easily have produced on his own farm. By this practise, he puts himself twice in the enemy's hands—once when

[1] Wilbur Aldrich, *Farming Corporations,* p. 169.

he sells, and again when he buys. This is not the highest and best idea of living by farming. The first thing a farmer should do is to surround himself in his farm home with everything he can make or produce that will promote the health, comfort, safety and pleasure of himself and family. This is what the farm is for, first. And how few good and needful things there be that may not be produced and provided on a good farm and in and about a real farm home! I do not attempt to name the innumerable good things of his own garden and orchard and field—all prime, fresh and exactly to his liking, which the provident farmer may have if he can only get that idea of raising things to sell out of his head or at least modified, and get that other idea of producing things on his own farm for his own use. If farmers everywhere would think first and work first to provide for their wants on their own farms, then they might be able to set the price on the surplus they have to sell. Then the surplus would not be so overwhelming in volume. Then there might be competition among the buyers of his surplus. The consumer might not then be so able as now to sit complacently waiting to be solicited to buy this enormous surplus at his own price. The railroad people then might take on better manners and be willing to give a more nearly just rate, and they might be more careful to give good service.

The farmer with the right idea of farming and of farm life and of farm opportunities, is the man I have most faith in to curb trusts and corporations generally—such as need curbing.

The makers of machines and implements and of barbed wire and of all that sort of thing, cannot eat their stuff—they must sell to get any good out of their product. They cannot live at all without selling. But the right kind of a farmer can live a long time without selling his product—he can eat it and live. Suppose the other fellow asks of you an exorbitant price for his wares. Just let him keep them a while, or try to keep them. They can't keep them, because they can't eat them; and to get something to eat, they must sell. But you, my farmer friends, can keep yours a while

and be living like kings—eating your bread and meat and good apples and fresh butter and eggs and milk. The other fellow can only keep his just a little while, until you hear the prices of his wares a cracking. The farmer is a trust breaker, if he only knows it. I have little faith in legislatures and courts and magazine writers and orators, as trust breakers. But the farmer with the right idea, as I have been trying to illustrate, can fortify himself in his farm home for a much longer siege than the manufacturer or the railroad manager can put up against him. And the beauty of it all is, the farmer can be happy all the same, and all the time.

That too many farmers neglect to provide their families with the variety and abundance of fruits and vegetables which they might and should produce primarily for home use, and that they also generally fail to appreciate the possibility of creating for themselves beautiful surroundings by planting flowers and shrubs and trees, is frankly admitted. This condition of affairs is to be regretted, and should be remedied. One of the greatest of economists, John Stuart Mill, has said: "Solitude in the presence of natural beauty and grandeur is the cradle of thoughts and aspirations which are not only good for the individual, but which society could ill do without."[1] We need more of the "thoughts and aspirations" such as the "natural beauty and grandeur" of the ideal country home may inspire, and it is certainly to be hoped that the American farmer will avail himself of his natural opportunities and surround

[1] *Principles of Political Economy,* Book IV, Chapter VI, § 2.

himself with everything which will add to the dignity and beauty of his home.

But if these beautiful surroundings are to be created they must first be desired by the farmers, and it will certainly be admitted that the desire for food, clothing, and shelter naturally and properly come first and should be satisfied before much attention is given to the creation of beautiful surroundings; and, again, to enjoy the beautiful surroundings, one must have leisure, and in order to have time, after satisfying the more urgent wants, to create and enjoy beautiful surroundings, it is important that the farmer avail himself of the most economical means of satisfying these wants. We object, therefore, to the general principle laid down by Mr. Kerrick, that farmers everywhere should "think first and work first to provide for their wants on their own farms," rather than to look primarily to the production of those things which will give them the greatest purchasing power in the market. We believe the latter method to be the one which will bring the largest means of satisfying wants for a given amount of exertion, whereas, Mr. Kerrick's suggestion points towards a reversion to the self-sufficing economy of earlier times, and to a sacrifice of much of the benefit which has resulted from the extension of commerce and from specialization in industry.

There are, doubtless, many injustices in the

present complex commercial system of agricultural production; but, in spite of this objection, the commercial system is superior to the old self-sufficing economy which was only desirable in an earlier stage of economic society when the dangers to commerce were so very great and the means of transportation had been so little developed that the farmers could gain little or nothing by producing for the market. Modern agriculture is not entirely commercial, yet the production for the market is the dominant feature. The commercial system has replaced the self-sufficing system, because it brings larger returns for the efforts expended, and our aim should be not to revert to a less economical system in order to avoid the evils which have arisen, but to remove the evils which accompany it and thus perfect the present commercial system.

When the farmer follows the rule of seeking the largest net profits, he will not be bound to any one system, he will produce for home consumption just to the extent that he can produce more cheaply than to buy upon the market. That which is good practise in this regard at one time and place may be bad economy at the same time at another place, and at the same place at another time.

A review of the development of commercial agriculture in this country will help us to under-

stand better the present situation in the United States.

The beginners of American agriculture were Englishmen, and the course which they first took in the New World was greatly influenced by the stage of industrial progress with which they were familiar at home. In the Seventeenth Century, the greater part of the land of England was divided up into small holdings cultivated by tenant or by landowning farmers who looked primarily to the production of such crops as were needed in their own households. In some parts of the country, however, the organization of agriculture had taken on a very different form. Large areas of land in the southeastern part of England had been made into sheep farms on which wool was produced primarily for the market.

Thus, in the Seventeenth Century, England had two types of farmers. The peasant farmer was a hard working, pains-taking tiller of the soil who was able to live "unto himself." The wool and flax which were grown on his little farm were manufactured by the farmer and his family into the various articles which were desired for home consumption. The peasant's house was usually of simple construction, such as the farmer could make for himself out of such materials as could be found in the immediate neighborhood. Cottages made of mud and straw were very common in the central and northern counties. This

farmer was just the kind to succeed in a new country where commerce could not be counted upon to supply such stores of goods as the wants of men demand.

The second class of English farmers had been in the habit of producing primarily for the market, and depending upon the market for the supplies of clothing, luxuries, etc., which it was their desire to consume. They had passed on to that stage in the evolution of industrial society where the commercial side of their agriculture dominated, and without a market they could not well survive. Having before our minds these two classes of English farmers, let us next take a glance at the country which they were to occupy.

The new country provided new crops, such as maize, potatoes, and tobacco, the culture of which could be learned from the Indians. The climate of the eastern coast of America is very different from that of England, and much colder than the settlers may have expected to find in a latitude so much south of their mother country. The Atlantic coast presents two very different areas; tide-water Virginia, with her mild climate, rich soil, and slow flowing rivers which were well suited for becoming the arteries of commerce into the interior; and New England, with her more severe climate, her poorer soil and rough surface traversed by swift flowing streams which

did not lend themselves readily to the purposes of transportation.

Both of these classes of English farmers came to America. Both classes went to New England and both classes went to Virginia. The first class, the self-sufficing farmers, got along well in New England. They learned to grow maize and potatoes. They found plenty of fish in the streams. Their old habits of building houses for themselves, manufacturing their own clothing, and producing and preparing for winter's use abundant supplies of food, made them the natural inhabitants of the isolated New England of that time.

But the commercial farmers were not so successful in the North as were their less pretentious fellow countrymen. They sought diligently for some agricultural product which could be transported to London with profit; for it was from London that they could draw the comforts and luxuries which they had learned to consume but which they were unable, themselves, to produce. As it was unprofitable in those early days to ship grain to London except in years when the price was abnormally high, and as no staple was found which would bear shipment to Europe, commercial agriculture was unable to play an important rôle in New England.

In the South, the commercial agriculturists met with better success. There, as in New England,

a thorough search was made for a staple which would form the basis of a profitable system of commercial agriculture. The production of silk was attempted, but with little or no success. Wine was looked to as a possible solution of the problem, but this, too, led only to disappointment. Tobacco was finally tried with success in the Southern Colonies, and the South was launched upon a career of her own. Tobacco had become fashionable in England, and demanded a high price. This was the opportunity of the commercial farmers. They could produce tobacco and send it by the cargo directly from the river wharves on their own plantations to the markets of London. This enabled them to order whatever they pleased from the merchants of Europe.

The labor problem arose. Free white men could do better working for themselves in a country where rich soil "was to be had for taking up."[1] Contract labor was resorted to, but this did not supply the demand. The African negro was introduced to supply the tobacco plantations with the desired number of laborers. And thus, it was tobacco and slaves that made commercial agriculture possible and profitable to the farmers of the South and led to the development of the large plantations of Virginia which were comparable in size and dignity to some of the estates of the

[1] Hart's *American History Told by Contemporaries*, Vol. II., p. 387.

country gentlemen of England. The small farmers were, sooner or later, crowded out of tidewater Virginia.

In the North the self-sufficing economy remained important for a long time. The small farmers from New England, New York, and Pennsylvania gradually moved westward, and it was the same conditions which made them successful in the early settlement of the North that fitted them for the life of the pioneer. Since the days of railways, new countries can be settled successfully by commercial agriculturists, but it was only yesterday that the self-sufficing pioneer was an important factor in the development of the resources of the United States.

The self-sufficing pioneer farmer was free from the power of trusts and corporations, but his life was full of hardships such as few farmers would now willingly endure. The following quotation, descriptive of the life of a pioneer family during their first year in their new home in western Pennsylvania, in 1773, sets forth the hardships of these pioneers in a very pathetic manner. "For six weeks we had to live without bread. The lean venison and the breast of the wild turkey, we were taught to call bread. The flesh of the bear was denominated meat. This artifice did not succeed very well, after living in this way for some time we became sickly, the stomach seemed to be always empty, and tor-

mented with a sense of hunger. I remember how narrowly the children watched the growth of the potato tops, pumpkin and squash vines, hoping from day to day, to get something to answer in the place of bread. How delicious was the taste of the young potatoes when we got them! What a jubilee when we were permitted to pull the young corn for roasting ears. Still more so when it had acquired sufficient hardness to be made into johnny cakes by the aid of a tin grater."[1]

The agriculture of the North has gradually been transformed until now the commercial element dominates. Manufacturing was for a long time a household industry carried on by nearly every farm family, but in the course of time more and more of this work was turned over to those who made a specialty of manufactures. The swift streams of New England were harnessed, and made to turn the wheels of industry. This movement followed but slowly the path of the pioneer farmer, yet in the course of time the older parts of the North became noted for their manufactures. With the development of manufactures, a market has grown up for the ordinary forms of farm produce, such as wheat, oats, pork, beef and dairy products. As markets have developed and the means of transportation have been

[1] Reverend Joseph Doddridge, *Hart's American History Told by Contemporaries,* Vol. II, p. 387.

improved, the old self-sufficing agriculture has been gradually transformed into a commercial economy, until the remnants, only, of the old system are now to be found.

From the standpoint of the farmer, the guiding principle in the organization of commercial agriculture is to seek the largest net profit; but there is another point of view than that of the farmer. Since not only the farmer, but every one else is interested in agriculture, the question arises, are the interests of the country as a whole best conserved when each farmer follows tenaciously his own self-interest and succeeds in winning the largest net profits in return for the effort which he expends in agricultural production? There may be at certain points, a conflict between the narrower and the broader interests. In this case we are confronted with the problem of determining whether the individual or the general interest should be promoted. To the extent that the greatest good to the greatest number demands that the general or social interests be conserved, it falls within the domain of our subject to propose institutions which will limit the free action of individuals in such a manner as to promote the highest interests of society as a whole.

But while *human welfare* or the greatest good to the greatest number has long been recognized as the standard by which every law or custom should be accepted or rejected, this principle is

so abstract that men may be fully agreed upon its acceptance as their standard, and yet hold exactly opposite opinions as to the desirability of a particular measure. The statesman needs a more concrete standard which may be used with safety in his efforts to set proper limits to the free action of farmers and of those with whom they have economic relations, in the pursuance of their daily toils.

The highest value of the productions of a country has been set forth as a practical economic ideal for the statesman. It has been said that "the prosperity of a nation is in proportion to the value of its productions."[1] This is the economic ideal which was set forth by their leaders as the aim and the end of the Patrons of Husbandry in their efforts to promote the interests of agriculture.

To this principle, as an economic ideal, it might be objected that legislation may be of such a character as to increase the value of the agricultural productions of a country and at the same time not improve the economic well-being of the people of the country as a whole. It is quite conceivable, for example, that duties on imports may be so levied as to increase the total value of the agricultural products of a country, without increasing the prosperity of the nation as a whole.

It is necessary, also, in order that this national

[1] See the Preamble of the Constitution of the Patrons of Husbandry.

ideal shall be attained, that the labor and the capital of a country be properly distributed among the various lines of economic activity. The labor and the capital of a nation should be so distributed among the various industries that the portion of these factors which is employed under the most unfavorable circumstances shall be equally productive in all industries. The necessity of this proper adjustment of the productive forces should ever be kept in mind in the discussion of the movements of population from country to city or *vice versa.*

When the productive forces are properly distributed among the various lines of production, and where the relative values of products are not to be directly affected, it would seem that a just and practical ideal to be held in mind when passing judgment upon the institutions which limit and define the rights of the farmers in their relations to each other, to their landlords, to laborers which they employ, and to those to whom they sell their products, would be the highest value of the agricultural productions of a country.

We wish to mark out clearly the distinction between the social ideal and the ideal of the individual. The individual seeks the largest *net* profits. He desires to have that share of the product which is left to him, after paying what is necessary to engage the other factors of production, as large as possible. Where the personal

interest of the farmer does not extend to all of the factors of production, conflicting interests are certain to arise, as between the landlord and the tenant, or the employer and the employee. While the farmer is interested, personally, in having his own share of the produce large in proportion to the efforts which he puts forth, the statesman should be interested equally in having the returns to all the factors of production as large as possible. It is, therefore, not the return to any one factor in particular, but the sum of the returns to all the factors which should be of vital interest to the statesman. With the limitations which have been suggested, the *highest long-time-average value of the total product of this industry, is, then, the goal, when agriculture is viewed from the standpoint of the nation as a whole.*

It will be our purpose in the following chapters, to outline the economic principles which the farmer follows when intelligently seeking to win the largest possible net profits; and also to note those circumstances under which the winning of the largest net profits on the part of the farmer does not result also in the highest value of the agricultural productions of the country as a whole. It will be attempted, further, to outline some of the methods which have been employed by public authority in its attempts to promote the agricultural interests, and to discuss the institutions which are essential to a proper adjustment

of the economic relations of those engaged in this industry.

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CHAPTER V

THE ORGANIZATION OF THE FARM. THE SELECTION OF LAND, LIVE STOCK AND EQUIPMENT; THE CHOICE OF CROPS; THE PLACE OF ANIMAL HUSBANDRY IN THE ECONOMY OF THE FARM.

Section I. The selection of land and capital-goods, or, the grades of the factors of production which should be brought together.—With the three factors of production to be organized in such a manner as will enable him to win the largest net profits, the first problem before the farmer is the selection of land, live stock and equipment. It has been seen that all the factors vary in productivity, and the question arises as to which grade of land a given farmer should select for his agricultural operations, and which grade of capital-goods he should employ.

The *proportions* in which the factors of production should be brought together will be discussed in the next chapter. There we shall have to do with the *quantities* of labor and capital-goods which should be expended upon a given area of land, the quantity of labor which should be associated with a given quantity of capital-goods, and the quantity of land, labor and capital-

goods which should be brought under one management in order that the best results shall be attained; but in this chapter quantities or proportions will be disregarded, and our attention will be fixed upon the *qualities* of these factors, with a view to determining which grades of land, laborers, horses, machines, etc., should be associated together.

When viewed from the standpoint of the highest value of the productions of a country it becomes apparent that the farmers who are qualitatively most efficient, should employ the most productive grades of capital-goods upon the most productive land. A mathematical illustration of this is as follows. Let the grades of farmers be represented by the figures 2, 4, and 6; the grades of capital-goods by the figures 1, 3, and 5; and the grades of land by the figures 8, 10, and 12. Having in mind that a given grade of land, for example, will yield twice as much product in value if farmed by the man whose efficiency is represented by figure four as it will if managed by the one whose efficiency is represented by figure two, etc., for the other grades and factors, let the reader try to multiply these figures together, taking one figure from each group, in such a manner that the sum of the products will be the greatest possible. Note that when the highest from each group are associated together, and the medium, and again the lowest are in turn associated together the sum

of the products will be the greatest possible, as for example, $(2x3x12)+(4x5x10)+(8x1x6)=$ only 320, whereas $(2x1x8)+(4x3x10)+(6x5x12)=496$, which is the maximum product which can be obtained.

The question arises at once as to the willingness of the farmers to select land according to this principle. There is no apparent reason why the best farmers should object to using the best land and the best live stock and equipment, but it is clear that the least efficient farmer could produce larger crops upon the more productive grades of land and by using the more productive forms of capital-goods than he can on the less productive land and by using the less productive horses and tools to which this formula assigns him. The fact which reconciles the less efficient farmers to the use of the lower grades of the factors of production, is the competitive price which must be paid for the use of the higher grades. For example, the farmers who are qualitatively more efficient can pay more for the use of the more productive land than their less efficient competitors can possibly pay, and yet at these higher rents these more efficient farmers find it to their interest to select the higher grades of land. This proposition will be further developed in the chapter on the distribution of wealth, where it will be shown more clearly why it is that the interest of

the individual farmers harmonizes with that of society as a whole in this regard.

After the student has followed through the further development of the subject this principle will not seem so abstract as it may appear on the surface. It will then be seen that if a farmer is only able to make a living on land with a low degree of productivity, that the chances of his making a living and paying the rent on the better grades of land where the rent will be higher, are very poor indeed. On the other hand if a farmer can make a profit on the low grade land, which enables him to lay aside something each year, the chances are that such a farmer can increase his savings by selecting more productive land and paying a higher rent for its use. The writer has known farmers who succeeded in making a living on cheap land, but who utterly failed to make the rent when they moved to better land, whereas there were other farmers who could pay the rent for the more productive land, and have more money left at the end of the year than they could possibly have had in case they had farmed the less productive land which could be had for a much lower rent.

This process of shifting the farmers who are qualitatively less efficient to the less productive land operates more or less automatically. The writer once knew a farmer who paid a cash rent for a farm of one hundred acres of good land.

Year after year he scarcely kept even, and would not have been able to make both ends meet had he not engaged in other work during a part of the year. Another farmer offered more for the use of the land than was being paid, and the old tenant gladly gave up the place rather than pay any more rent than he was paying. The second farmer has paid the higher rent and saved money year by year, and at the same time the first mentioned farmer moved to cheaper land where he has been able to make a living and even a little more, and has not felt so keenly the burden of the rent.

It is a matter of common observation that the best farm land is usually occupied by intelligent and thrifty farmers, whereas the less desirable land is usually occupied by men not so well endowed by nature to put the land to its highest use, and hence who are not capable of competing for the more productive grades of land. The writer's attention was called to this fact, with regard to the distribution of the population over the different grades of land, some years ago, both by Professor Turner and by Professor Van Hise of the University of Wisconsin; but it was later, in a study of the influence of variations in the qualitative efficiency of farmers upon the amount of rent that would be paid for the use of farm land under competitive conditions, that the economic principle which explains this fact was discovered.

It will be shown, in the chapter on distribution, that the net profit which any farmer can make will vary with the grade of the land; that the farmer who has the highest degree of qualitative efficiency can make much more than a living on land of any grade, but that he can make the largest net profit on the most productive land after outbidding all competitors for its use. It will be shown that the farmer whose degree of qualitative efficiency is half way between the highest and the lowest, can make a living on many of the different grades of land, but that owing to the higher rents which the more efficient are willing to pay for the better grades of land, he can secure the largest net profit by employing that grade of land which corresponds to his degree of qualitative efficiency. And finally it will be shown that the farmer with the lowest degree of qualitative efficiency can hope to make a living only on the least productive land. The same principle holds with regard to the selection of capital-goods, and also of laborers where laborers are employed.

Attention has been called to the variation in the efficiency of the farmers, but it should be noted also that the efficiency of a given farmer may be different in the various branches of the agricultural industry. A man can usually do best that for which he has a natural liking or taste. Each farmer should decide, therefore, which branch of agriculture he can follow to best advan-

tage and then select the grade of land and capital-goods, suited to that branch of agriculture, which correspond to his degree of qualitative efficiency as a producer in that branch of the industry, for such a choice will enable him to win the largest net profit.

Section II. The selection of crops and the organization of the field-system.—When the land is selected on which the farmer is to carry on his agricultural operations, the next important question which arises pertains to the selection of the crops which are to find a place in the field-system. The Roman agricultural writer, Pliny the elder, quotes a maxim which was said to have been handed down from the ancients, to the effect that he is a bad farmer indeed who will buy anything which he can produce upon his own farm.[1] But Albrecht Thaer, the leading German agriculturist of one hundred years ago, and perhaps the greatest agriculturist Germany has produced, taught the farmers of his generation to produce nothing for themselves which they could to better advantage purchase upon the market.[2] The maxim quoted by Pliny points towards the self-sufficing economy of early times when the goal of the husbandman was the direct satisfaction of all the

[1] Bohn's Classical Library, *Natural History of Pliny*, Vol. IV, p. 16; also Dickson's *Husbandry of the Ancients*, Vol. I, p. 208.

[2] Wilhelm Körte, Albrecht Thaer, *Sein Leben und Wirken, als Arzt und Landwirth*, pp. 102-103.

wants of his household; but Thaer lived at a time when commerce had so developed and industry had become so diversified that production for the market had become very important. The followers of Thaer learned to select those crops which would enable them to win the largest net profits, and to exclude all others from the field-system.

This process of selecting the crops which enable the farmer to win the largest net profits is an important factor in determining the geographical distribution of farm crops in modern times. While all plants will not thrive under the same conditions, there are usually several species present to compete for the use of each piece of land. When Nature is left to herself, the plants which are best fitted for this competitive struggle survive and occupy the land; but when man intervenes the useful plants are given especial care while the plants which are harmful or of no use are destroyed.

Under the self-sufficing economy of earlier times, *all* the useful plants which could be made to thrive were cultivated on each farm. The greater the variety of crops which each husbandman could produce the greater the degree of his well-being, for each household was a little economic world striving to subsist upon the immediate products of its own industry.

But under the régime of modern commercial agri-

culture, where each farmer produces primarily for the city, national, or world market, and buys upon the market the majority of the goods he consumes, his well-being depends less upon the variety of his own productions, and more upon his power to command the desired commodities upon the market. This power does not depend upon the variety, but upon the cost, quantity, and price of the articles which he takes to the market. Cost, or cheapness of production, is not the one determining factor; neither is the quantity of the product. The selling price would also be a poor guide in itself. But when the cost of producing an article, the quantity which one man can produce, the capacity of the crop to fit itself into the field-system, and the farm price of the product, are all taken together, it will be found that, with prices as they are at a given time, some crops will net the farmer a handsome profit, while others can be grown only at a loss. The economic well-being of the modern farmer depends, then, upon his capacity to select and produce that crop or combination of crops which, one year with another, will enable him to win the largest net profit.

The organization of the farm is essentially different from that of the factory. In mechanical pursuits it is the common thing for each man to devote all of his time throughout the year to the production of that one article or class of articles

which he can produce to the best advantage. In agriculture, however, the production of any one crop requires the attention of the farmer for only a portion of the year, and various crops demand his attention at different seasons, so that his labor, horses, and machines are usually employed more economically in a system of diversified farming than in a single crop system, even if the crop needing attention at one time is less profitable than that requiring attention at another time.

The crops which require attention at the same time of the year may be looked upon as *a group of competing crops.* Those crops which require cultivation for six or eight weeks during the early period of their growth, such as maize, cotton, tobacco, potatoes, sugar beets, etc., may be classed together as a group of competing crops, because they compete for the attention of the farmer,—for his labor, horses, tools and machinery. The winter grains, rye and winter wheat, or the spring grains, oats, barley, and spring wheat, may be given as other groups. These separate groups may be called *non-competing groups,* because the members of one group require the attention of the farmer at a different time than do the members of the other groups. For example, maize, cotton, etc., do not compete with oats, barley, etc.

The farmer who seeks to use his labor and capital to the best advantage should select from each group of competing crops that one which will add

the most to the farmer's net profit and should introduce as many non-competing crops into the field-system as will add sufficient to his net profit to pay him for his trouble. When this principle is followed it will often happen that of two non-competing crops in the field-system, one will yield a larger net profit than the other. Yet when the year's accounts are balanced, it will be found that the total net profit of the farmer is greater when both crops are cultivated than when but the one is grown, even if the one is less profitable than the other, for each crop represents the most profitable use to which the labor, horses, tools and machinery can be put at the given time, and if not used in that way they must be put to a less productive use or to no use at all.

But of two competing crops, only the more profitable one should be produced. Take maize and sugar beets, for example, in that part of the United States where the sugar-beet region lies within the "corn belt." Indian corn and beets require the attention of the farmer at the same time of year and if the one crop increases the other must decrease. Hence beets must here prove equally profitable, that is they must add as much as maize to the farmer's total net profit, before they can be cultivated without loss. The beets may yield the larger net profit per acre, and yet prove less profitable to the farmer because he cannot operate so many acres of beets as of

maize. In order to arrive at the total net profit which he can win from the production of a given crop, the net profit per acre must be multiplied by the number of acres which the farmer can operate.

Cotton and maize are competitors in the South. For many years after the Civil War cotton yielded a much greater net profit to the farmers than did maize. As a result, maize was little grown in the South, the supply being drawn from the North where cotton does not thrive. Toward the close of the last century the profits of cotton growing considerably declined and maize production took a more important place in the field-system of the South.

When the above principle is followed in the organization of the field-system, it will not be true, necessarily, that each crop will be grown where the facilities for its production are the greatest; for it may happen, for example, that in the region where the facilities for the production of tobacco are the best, sugar beets will yield a larger net profit than tobacco, in which case the latter crop might well be excluded from the field-system in the very region where, aside from the element of rent, it can be produced most cheaply.

It is evident that changes in the relative value of farm products will necessitate changes in the organization of the field-system. If the price of one of two competing crops should rise more rapidly than that of the other, this might result in a

change from the one crop to the other. Changes of this kind often come about in certain districts, because of the growth of a great industrial and commercial center in that part of the country. Take, for example, the farms located within a few miles of Chicago. Seventy years ago there was practically no home market, and the farmers, to the extent that they produced for the market at all, produced those crops which when shipped to the East would yield the largest net profit; but in the meantime the development of a market close at hand has greatly influenced the organization of these farms. The local demand for milk and for garden produce has made it most profitable for the farmers to devote themselves more or less exclusively to dairying and market gardening. This is due to the well known fact that location with respect to the market has a greater influence upon the price of some commodities than upon that of others; that is, a dollar's worth of one commodity can be shipped more cheaply or in better condition than can a dollar's worth of another commodity. Thus it is that the farmer must ever be alert to the changes which are going on in the whole industrial world if he would perfectly adjust his production in such a manner as will bring the largest net profits.

Fluctuations in land rents, without any change in the relative value of the products, may necessitate the reorganization of the field-system. Sup-

pose, for example, that the rent of a given piece of land is three dollars per acre, and that the net profit per acre is five dollars when the land is devoted to maize, and that the net profit is twenty dollars per acre when the land is devoted to sugar beets; but that the farmer can operate thirty-five acres of maize and only seven acres of beets. Then he could win one hundred and seventy-five dollars net profit by producing maize, and only one hundred and forty dollars by producing beets. But, suppose the rent of the land should rise to five dollars per acre, without any change in the prices of the products or in the costs of production. The profits per acre of maize would then be three dollars, and that of an acre of beets would be eighteen dollars, so that, with the same proportions as to the number of acres which the farmer can operate of these two crops, the total net profit which he could win from the production of maize would be reduced to one hundred and five dollars, while that from the beets would have been reduced to one hundred and twenty-six dollars only. In this hypothetical case the rise in the rent would result in a subtraction of only fourteen dollars from the total profits of the beet crop, while it would result in a reduction of the profits on maize of seventy dollars, so that the crop which was the more profitable before the rise in the rent would become the less profitable as a result of the rise in rent.

It is a well recognized fact that the different crops make different demands upon the soil. For this reason the crops which are associated together in the systems of rotation should be such as will make supplementary demands upon the soil's elements of fertility. This in itself, however, is not a safe guide in determining which plants should be introduced into the field-system; for it might lead to the cultivation of the less profitable of two competing crops and thus reduce the farmer's total net profit. Yet it should ever be kept in mind that if one of two competing crops exhausts the soil while the other adds to its fertility, this must be taken into account when calculating the *net* profit which these crops can be made to yield. The crops being chosen which will, one year with another, enable the farmer to win the largest net profit, they should be arranged in the field-system in such a manner as best to supplement each other in their demands upon the soil.

A comparative study of the crops and field-systems of Europe and America will throw some light upon the situation in America. A three-field system of crop rotation prevailed throughout Europe during the Middle Ages. Under this system, the arable land was divided into three parts. One part was sown with winter grain, one part with spring grain, and the third part was fallowed. The fallowed field was cultivated carefully to destroy the weeds and to bring the soil

into good tilth. The field which was fallowed one year was sown to winter grain the next, and to spring grain the following year, so that each field was cleaned of weeds and brought into good tilth every third year, during which year the field yielded no product.

This system was in very general use throughout Europe down to the close of the Eighteenth Century, but by that time the industrial and commercial population was making such demands for agricultural products that the more intelligent farmers began to think it too great a waste to cultivate a third of the arable land each year with no crop growing upon it. A general search was made for a crop which could be grown in place of the bare fallow, and at the same time allow the soil to be cleaned of weeds and cultivated preparatory for the sowing of grain. Indian corn had already been introduced in the countries along the Mediterranean, but unfortunately this crop, which is the one grain crop which can be cultivated successfully while growing, was ruled out by the climate, in the greater part of Europe, so that turnips, potatoes, and beets were resorted to. Besides the root crops, clover was introduced, and the rotation changed into a four-course system in which roots, summer grain, clover, and winter grains succeeded each other in the order given. On heavy clay soils where the root crops would not thrive beans sometimes took the place

of the root crop in this four-course system. During the last quarter of the Eighteenth Century and the first half of the Nineteenth, this four-course system gradually replaced the old three-field system and its bare fallow. The root crops came to be called "fallow crops" because they were looked upon as incidental to the fallowing of the land in preparation for the grain crops. The grains continued, at least until 1875, to be the most valuable crops.

Since the fall in the price of cereals, about thirty years ago, the European field-system has been quite upset. Those articles which will not stand long shipment, such as milk, vegetables etc., prove most profitable, because foreign countries cannot compete so successfully upon the European markets. As a result grain land has, in many instances, been converted into pastures. A good example of this is found in eastern England where many old wheat fields have been converted into permanent pastures for dairy cows. The production of green fodders for cattle has proved relatively more profitable in recent years than formerly. Truck farming has been rapidly developed. In general, the tendency has been for the farmers to disregard all systems of crop rotation and produce such crops as will enable them to secure the greatest net profit. Commercial fertilizers are generally used, so that it is possible to adjust the chemical content of the soil to the

demands of the plants instead of trying to adjust the plants, by means of crop rotation, to the chemical content of the soil.

The old three-field system was the rule in northern and western Europe during the first two centuries of American colonization, yet the bare fallow never became permanently established in the American colonies. The colonists were, from the beginning, well provided with valuable crops, which could be cultivated while growing. Indian corn and tobacco made the bare fallow unnecessary and practically unknown in this country long before "fallow crops" were generally introduced in northwestern Europe. And while our country has greatly expanded, cotton, maize and tobacco have continued to make fallowing unnecessary in most parts of the United States. In parts of Canada, and in the United States along the northern border, along the Pacific coast, and on the high table lands of the plains these crops will not thrive, and the conditions with regard to available crops are more nearly the same as in western Europe.

Thus, of the group of competing crops to which Indian corn, cotton, tobacco, and roots belong, the farmers of northwestern Europe have only the roots to select from. It is true that small areas are devoted to tobacco in northern Germany, but this is of no general significance. Hence, in Germany, for example, sugar beets

have only to prove more profitable than potatoes, which are grown in large quantities for the distilleries, or turnips, and fodder beets, which are grown for the feeding of cattle, in order to be introduced with profit into the field-system. Whereas in the "corn belt" of the United States, sugar beets must prove as profitable as maize before there is any economy in their introduction.

Under these circumstances it might be true that the facilities for producing sugar beets were greater in the "corn belt" of the United States than in Germany; and yet in case the maize, which cannot be grown in Germany, should prove more profitable than the beets there would be no economy in producing beets in the United States, while at the same time they might prove profitable in Germany, in spite of the poorer facilities, because of the lack of a more profitable crop to take their place in the field system. This example illustrates the principle which was well understood by the classical economists, namely, that: "A thing may sometimes be sold cheapest, by being produced in some other place than that at which it can be produced with the smallest amount of labor and abstinence."[1]

Section III. The place of animal husbandry in the economy of the farm.—The importance of live stock in the economy of the farm is shown

[1] John Stuart Mill, *Principles of Political Economy*, Book III, Chapter XVII, § 1.

by the fact that on June 1, 1900, the live stock on farms represented fifteen per cent. of the total value of all farm property; and by the further fact that the value of the animal products sold or consumed by the farmers in 1899, represented forty-five and seven-tenths per cent. of the total value of all farm products sold or devoted to the personal use of the farmers and their families during the same year. The following table shows the valuation of farm property[1] and products[2] as reported in the twelfth census.

VALUATION OF FARM PROPERTY AND PRODUCTS

Kinds of Property	Value of Each Kind	Per-centage
Land and Improvements	$16,674,690,247	81.3
Live stock on hand June 1st	3,078,050,041	15.0
Implements and machinery	761,261,550	3.7
Total value of farm property	$20,514,001,838	100.0
Kinds of Products		
Crops not fed to animals	$2,045,187,485	54.3
Animal products	1,718,990,221	45.7
Total	$3,764,177,706	100.0

QUANTITIES AND VALUES OF SPECIFIED ANIMAL PRODUCTS, AND VALUES OF POULTRY RAISED, ANIMALS SOLD, AND ANIMALS SLAUGHTERED ON FARMS IN 1899[3]

Products	Value
Wool	$45,723,739
Mohair and goat hair	267,864
Milk, butter, and cheese	472,369,255

[1] Twelfth Census, Vol. V, pp. xxix, xxxii, and xxxvi.
[2] *Ibid.*, Vol. V, p. cxxi.
[3] *Ibid.*

Products	Value
Eggs	144,286,158
Poultry	136,891,877
Honey and wax	6,664,904
Animals sold	722,913,114
Animals slaughtered	189,873,310
Total	$1,718,990,221

The value of crops fed to stock, in 1899, was reported as $974,941,046, or 32.3 per cent. of the total reported value of all crops of the country. These crops and the pastures of the country formed the basis for the production of the $1,718,990,221 worth of live stock products. Of the total value of animal products sold or used, the most important items were the value of animals sold and slaughtered, which was $912,786,424, and that of dairy products, which was $472,369,255.

There are certain crops such as cotton and tobacco which are always intended for the market in their native form, but there are many other crops, such as the grains and the hay and forage crops, which may be sold in their native form or transformed by the farmer into animal products. The farmer has ever before him, therefore, the problem of determining whether the largest net profit can be obtained by selling or by feeding these crops.

The live stock industry comes into competition to some extent with the production of field crops.

The farmer who feeds and properly looks after hogs, cattle, or sheep, cannot spend as much time in the field as he who keeps no stock of these kinds. The dairy industry comes more into competition with the crops of the fields, than do the other live stock industries. But while a part of the time devoted to live stock must be subtracted from the time which can be spent in the field, yet, for the most part, the live stock industry is supplementary to the other branches of agricultural production. Live stock requires the especial attention of the farmer in the winter when nothing can be done in the fields. In the summer, when the farmer is busy in the field, much of the live stock is shifting for itself in the pasture, and there is usually enough time when the ground is too wet for work in the field, to permit the farmer to give the needed attention to the live stock which is in the pasture.

To the extent that the live stock industry is supplementary, in its demands upon the time and energy of the farmer, to the production of farm crops, he has only to decide whether the additions to his total net profit, resulting from the transformation of the various crops into animal products, are sufficient to remunerate him for the efforts put forth. But to the extent that the live stock industry encroaches upon the time and energy available for crop production, the problem of determining whether to sell his crops or con-

vert them into animal products presents itself in practically the same form as that of selecting crops for the field-system. The general principle is simple,—seek the largest long-time-average net profit,—but the practical application of this principle is especially difficult, because of the limited extent to which these two lines of work come into conflict with each other. It can be said, however, that the live stock industry should enable the farmer to win as large a net profit as he could secure from other sources, and enough more to make worth while the extra effort put forth when he could have found employment in no other line of productive activity, but which time might have been spent in enjoying the products of his labor or in improving his mind.

The problem of deciding upon the kinds of live stock to be kept should be solved by the principle which has already been discussed under the head of crop competition. It is perhaps true that personal likes and dislikes enter more largely into the situation here than in the selection of crops, but having taken this element into account, the various branches of live stock production may be classified according to whether they are more or less competitive with or supplementary to each other and with the field crops, in their demands upon the time and energy of the farmer, and then the selection should be made on the basis of the

largest possible addition to the farmer's total net profit.

One factor ever to be kept in mind in counting the profits of the live stock industry is the value, as fertilizer, of the manure, which is a very important by-product of this industry. This element is usually underestimated in a new country, but in the older countries where commercial fertilizers have long been necessary if the farmer would secure the largest net profit in the production of field crops, full value must be given to this by-product.

Professor Charles F. Curtiss, of the Iowa Agricultural College, says:[1] "Maintenance of fertility is secured by rotation of crops, by chemical fertilizers, and by physical and bacteriological methods; but by none of these has the virgin strength of the soil been maintained over long periods except as plant production has been associated with animal husbandry. By selling dairy products in the form of butter and cheese and restoring the by-products by feeding the skim milk, buttermilk and whey we take from the soil but one-tenth of fertility lost by a grain crop. . . . If fertilizing material must be bought for the farm, it can, under all ordinary conditions, be bought in vastly cheaper form as feed-stuffs and utilized as such, and the residue applied to the

[1] From a paper entitled, "Economic Functions of Live Stock," read before the Economic Section of the A. A. A. S., St. Louis, December, 1903.

soil, than by purchasing fertilizers outright. The very best of fertilizers are often obtained in this way without any direct outlay. The use of feed stuffs, rich in fertility, may even return a handsome profit as a separate proposition, and thus fertilizing constituents come on to the farm under most advantageous circumstances. The British and other European farmers buy large quantities of our flaxseed and corn by-products. They figure that they are the gainers even if they do not make any profit on their feeding operations with these products, and they are. Until recently the packing-house by-products, including dried blood and tankage in various forms, have practically all gone direct to the land as fertilizers. To-day these products are serving a most important purpose as feed stuffs, and the time is near at hand when practically every pound of this material will first be utilized as stock food, and later returned to the soil. The returns are so much greater and so much more economical in this way as to put the purely commercial-fertilizer farmer out of business in the space of a few years at the outside, where other conditions are similar."

The feeding of grain, hay, and fodder to live stock is an effective means of converting these crops into products of higher specific value, which will better stand the costs of transportation to distant markets. "Cattle and hogs not only convert, but also condense Indian corn. They enable it

to be profitably raised in regions too far removed from the markets of the country to be transported in that form. By condensing the Indian corn to one-fifth or one-sixth of its bulk and weight, and reducing the cost of transportation in something like a similar proportion, the possibility is secured of raising Indian corn in regions situated thousands of miles from the market at which the corn products or, what is practically the same, the pork and beef are consumed."[1]

Maize is produced primarily for the feed lot. Only 18.7 per cent. of the maize crop of the United States, for 1903, was shipped out of the county where it was grown.[2] Twenty-eight and six-tenths per cent. of the oat crop[3] and 57.9 per cent. of the wheat crop[4] was shipped out of the county where grown. But the proportion of the maize crop which is fed varies greatly in the different parts of the country. The farmers of Illinois produced 264,087,431 bushels of maize, in 1903, 52.8 per cent. of which was shipped out of the county where it was grown, and 41 per cent. of which was yet in the hands of the farmers on March 1, 1904; whereas the Iowa farmers produced 229,218,220 bushels of maize in the same year and only 6 per cent. of their crop was shipped

[1] *Monthly Summary of Commerce and Finance,* February, 1900, p. 2279.
[2] *Yearbook of the Department of Agriculture,* 1903, p. 588.
[3] *Ibid.,* p. 607.
[4] *Ibid.,* p. 598.

out of the county where grown, and they had but 30 per cent. of the crop on hand March 1, 1904.[1]

That the Iowa farmers feed their maize more generally than do the Illinois farmers is indicated by the fact that the principal source of income on 40.5 per cent. of the farms of Illinois was hay and grain, and on 43 per cent. it was live stock; whereas in Iowa the principal source of income was hay and grain on but 32 per cent. of the farms, and live stock was the principal source of income on 58.5 per cent. of the farms.[2] There were 3,710,020 hogs in the state of Illinois on January 1, 1904, while there were 7,364,268 in Iowa.[3] On the same date there were 2,689,193 cattle in Illinois and 4,865,626 in Iowa.[4] These facts point definitely to a great difference in the farm organization in these two states.

There are, doubtless, several reasons for this difference in the farm economy of these two states, but distance from the markets is certainly a very important factor. The distilleries of Illinois make a demand for materials valued at $3,734,652,[5] and by far the most important of these materials is maize,[6] while no maize was used for this purpose in Iowa. The glucose factories of Illinois used materials valued at $12,988,845,

[1] *Yearbook of the Department of Agriculture*, p. 588.
[2] *Twelfth Census*, Vol. V, Table 18.
[3] *Yearbook*, U. S. Department of Agriculture, 1903, p. 673.
[4] *Ibid.*, p. 663.
[5] *Twelfth Census*, Vol. IX, p. 614.
[6] *Ibid.*, p. 615.

which was, doubtless, practically all maize; whereas, the material used for this purpose in Iowa was valued at $2,784,388.[1] There was more starch made from maize in Iowa than in Illinois, it is true, but the total value of the materials used for this purpose in Iowa was only $623,814.[2] On the whole, therefore, it is clear that the local manufacturing industries make a much greater demand for maize in Illinois than in Iowa.

Chicago is so located as to be the principal market for maize shipped from both states and the Illinois farmers have the advantage over the Iowa farmers in lower freight rates to this market. Chicago is the largest "primary market" for maize in the country. During the fifty-two weeks ending January 2, 1904, the receipts of maize at Chicago were 91,560,168 bushels, and the shipments from this market were 87,523,525 bushels.[3] So far as the writer has been able to ascertain, the freight rate per one hundred pounds of hogs in car-load lots from the various Iowa and Illinois railway stations to Chicago, is about twice that for maize in car-load lots from the same stations. It appears, also, that the rates for these commodities are, on the average, about twice as high from the Iowa as from the Illinois stations. On the assumption that the feeding of

[1] *Twelfth Census*, Vol. VIII, p. 163; Vol. VII, pp. 8 and 234.
[2] *Ibid.*, Vol. IX, p. 576.
[3] *Monthly Summary of Commerce and Finance*, December, 1903, p. 2035.

the maize to hogs and cattle condenses the product to one-sixth its original weight, there would be a considerable saving in freight, by such condensation of the product, in Illinois as well as in Iowa, but the saving would be twice as great for the Iowa farmers as for the Illinois farmers, and as the price of maize rises, the point where it would be more profitable to ship the maize than to convert it into live stock products would be reached in Illinois before it would be reached in Iowa.

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CHAPTER VI

THE ORGANIZATION OF THE FARM, CONTINUED. THE PROPORTIONS IN WHICH THE FACTORS OF PRODUCTION SHOULD BE BROUGHT TOGETHER, WITH ESPECIAL REFERENCE TO INTENSITY OF CULTURE.

Agriculture is said to be extensive or intensive according to the amount of labor, capital-goods, and managerial activity devoted to each acre of land. When a small amount of labor, capital-goods, and managerial activity is employed on each acre of land the culture is said to be extensive, when a large amount, it is said to be intensive. There is variation also in the amount of labor which is associated with a given amount of capital-goods. In the United States we use relatively large amounts of capital-goods compared with the amounts of labor employed, while the reverse is true in China. There may be wide variations, also, in the amount of managerial activity associated with a given amount of labor and capital-goods. At a given time and place some definite proportion of each of these factors should be associated if the best results are to be attained.

Not forgetting that "the largest total net profit" is the ideal which we have ever before us, when considering this subject from the standpoint of the farmer, let us assume that the farmer has at his command, land, laborers, and capital-goods already brought together in the most desirable proportions. Then, leaving until later the discussion of the rules which should be followed in determining these proportions, we shall first attempt to ascertain the number of composite units, made up in the proper proportions of the other factors, which should be brought under a given amount of managerial activity.

Assuming that a farmer wishes to devote a given amount of effort to the management of agricultural operations, the question arises whether he should give this effort to a large number of these composite units and give but little attention to each unit, or devote this same amount of managerial activity to a small number, and give very close attention to each unit. If the number of these composite units under one management be increased, without any increase in the amount of effort put forth on the part of the manager, so that less and less attention is given to each unit, a gradual decrease in the return per unit will take place as the number of units is increased, until finally a point will be reached where all of the net profit secured by adding another unit will be absorbed by the subtractions from the

returns to the units already employed. In other words, each succeeding composite unit brought under a given amount of managerial activity will add less and less to the total product until finally the point will be reached where the net addition to the total product due to an additional composite unit will no more than pay the costs of engaging the coöperation of such unit, and at this point the additions should cease if the farmer would attain to the ideal, that is, if he would secure the largest net profit for a given amount of exertion.

This point may be illustrated by means of the following table, in which the number of composite units (a unit may be thought of in this illustration as one laborer and the amount of capital-goods and land which should be associated with him) to be associated with one unit of managerial activity (which may be thought of as the amount of such activity which one farmer wishes to devote to agricultural production) is increased from one to ten, and as a result of the increase in the number of the composite units brought under the one management the net profit per composite unit is represented as gradually falling from $260 to $40, while the resulting net profit per unit of managerial activity is represented as increasing until after the fifth composite unit is added, after which it is represented as falling.

Number of Composite Units Associated with a Unit of Managerial Activity	Net Profit per Composite Unit	Net Profit per Unit of Managerial Activity
1	$260	$260
2	240	480
3	220	660
4	190	760
5	160	800
6	130	780
7	100	700
8	80	640
9	60	540
10	40	400

The figures here used are selected more or less arbitrarily, it is true, but we believe they illustrate quite clearly the general truth that, as the number of the composite units brought under one management is increased, the average return per composite unit, and hence the average net profit per composite unit will fall, but that for a time this fall in the net profit per composite unit is more than balanced by the increase in the number of such units, and the net profit per unit of managerial activity continues to increase until finally the point is reached where the net profit per unit of managerial activity reaches its maximum, and if the number of composite units associated with a given amount of managerial activity be increased beyond this point the net profit per unit of the latter, and hence the total net profit which the farmer will be able to secure as a manager, will be reduced below the possible maximum.

When a great deal of managerial activity is

devoted to a small number of the composite units of the other factors, the management may be said to be intensive, and when a small amount the management may be said to be extensive. The proper degree of intensity of management is that which yields the largest net profit per unit of managerial activity, and this point will be reached when the addition of another composite unit would add to the total product no more than enough to pay the costs of enlisting its coöperation. This principle applies to the different factors severally as well as collectively. The amount of land brought under one management may be increased to advantage until the last increment results in a net addition to the total product no greater than the rent which must be paid to secure the use of the land. The same proposition holds for the other factors. But the problem still remains as to the proportions which will exist between the three factors, land, capital-goods, and hired laborers, when the amount of each of these brought under one management is determined by this rule. These proportions and especially the amount of labor and capital-goods to be used upon a given area of land may, with profit, be considered in considerable detail.

Let us first consider the proportions which should exist between laborers and capital-goods in this composite unit, and then try to ascertain the proportions which should exist between land

and this smaller composite unit made up of laborers and capital-goods.

In the case of a farmer who hires no laborers, but performs all the labor himself, the first of these problems merges itself into the one we have just discussed, and the simple statement will suffice that: additions to the supply of capital-goods are justifiable so long as such increments result in a net addition to the total product, greater than the cost of securing their coöperation in production. But where the farmer devotes his time primarily to the management of the farm and hires large numbers of laborers, the proportions in which these two factors should be brought together is not a simple problem.

There is no fixed ratio, which holds good for all times and all places, between the number of laborers and the amount of capital-goods which should be employed in the production of any particular crop, and of course the proportion will vary with the crops which are being produced. Nearly everything that is now done by machinery has one time been done by hand, and much that is now done by hand may some day be done by machinery. At a given time and place, however, there should exist a certain ratio between the number of laborers and the amount of capital-goods brought together in any particular line of production, in order that the farmer may win the largest net profit for his efforts.

It often happens that a fixed number of laborers must be combined with certain capital-goods; for example, one man is required for each harvesting machine; but in many cases it may be a matter of indifference, aside from the element of profit, whether the work be done by hand or by horse power and machinery. In the production of wheat, for example, the proportion of capital-goods might be reduced and the same produce obtained by increasing the number of laborers. The reverse of this proposition is also true. But while these variations may be made arbitrarily they have an influence upon the amount of the farmer's share of the product. Of all the various operations necessary to produce and market a bushel of wheat, some can be performed more cheaply by the use of horses and machines, others by means of laborers.

Where the farmer's aim is to have the net profit which is left after paying the hired laborers and paying for the use of the capital-goods, as large as possible, every operation should be performed by laborers, if this method will lower the costs of production, increase the product, or in any other way increase the net profits; and everything should be done by means of horses and machines or other forms of capital-goods, which can be done to better advantage in that way. It may often happen that the cost of performing certain farm operations can be reduced by the use

of horses and machinery in the place of laborers, but it may at the same time happen that the product resulting from these operations is likewise reduced. It is not always true, therefore, that every operation should be performed in the least expensive manner, in fact, it may easily happen that the most expensive method will result in the largest net profit.

One point never to be overlooked in considering the desirability of substituting laborers for capital-goods or *vice versa,* is, the relative demand which will be made upon the time and energy of the manager. Any change in the proportions of these factors in the composite unit, which will increase the amount of managerial activity per such unit, must sufficiently increase the farmer's net profit per composite unit to balance the loss due to the reduction in the number of such units which can be brought under a given unit of managerial activity.

Where the substitution of the one factor for the other makes no change either in the quantity of the product or in the amount of managerial activity required, the rule is a simple one: where there is a choice between using laborers or capital-goods in the performance of certain operations, choose the cheaper method. And yet, the qualifying phrases in this formula are so important that the problem is far from being a simple one, and in many cases, perhaps in most cases, it is the

more fundamental principle of seeking the largest net profit per unit of managerial activity, which must be kept uppermost in mind.

A change in the rate of wages without a corresponding change in the rate of return to capital, or *vice versa,* will necessitate a readjustment of the relative amounts invested in the employment of laborers and in the employment of capital-goods. As wages rise relatively to the returns to capital-goods, there should be less labor and more capital-goods employed. Improvement in machinery often make it profitable to substitute capital-goods for laborers. The self-binder, the hay-loader, and the windmill are examples where this has been true.

Having decided upon the proportions in which laborers and capital-goods should be associated, the farmer is still confronted with the problem of determining how many composite units, made up of laborers and capital-goods in the proper proportions, should be employed upon a given area of land in the production of a given crop. This is the problem of determining the proper *intensity of culture.* There is always some degree of intensity which will yield the largest net profit; but what is that degree of intensity?

For the sake of simplicity, let us first suppose that the farmer can get as much land of a given grade as he may want to use, without paying anything for its use. Under such circumstances,

how many composite units, composed of laborers and capital-goods should be associated with an acre of land? For the purposes of this illustration let us assume a small composite unit, the use of which costs the farmer one dollar. It is obvious that in the production of maize, for example, the application of one of these units, per acre of land, would ordinarily produce very little, if any maize at all. It is possible that the expenditure of two units would produce a small crop; but then the third unit would increase the product more than the second, the fourth more than the third, and so on until a point of stationary returns has been reached, after which the succeeding units may be said to continue for a time to add less and less to the total product, until a point may be reached where further applications would add nothing to the total product. Thus in agricultural production the returns to succeeding composite units made up of laborers and capital-goods, may be said to follow the law of increasing returns until a point of stationary returns has been reached, after which the law of diminishing returns per succeeding unit commences to operate.

This may be illustrated by means of a diagram. In Fig. 1 the composite units of labor and capital-goods applied to a given acre of land are measured on the line *A B*, commencing at *A*. The line *A I' B* represents the increasing and diminishing returns per succeeding unit. Having in mind land

with a given degree of productivity, the distance between the lines $A\,B$ and $A\,I'\,B$ will depend upon the degree of qualitative efficiency possessed by the farmer who operates the laborers and the capital-goods, and also upon the character of the laborers and capital-goods which he employs. For this reason it will be necessary to keep in mind a given farmer employing a given grade of laborers and capital-goods, as well as a given piece of land. With these conditions in mind we may speak of the area $A\,C'\,C$ (Fig. 1) as representing the product which would result if but one unit were employed per acre, and of the area $C\,C'\,D'\,D$ as representing the increase in the product due to the addition of the second unit and so on for the succeeding units. As illustrated in Fig. 1, the

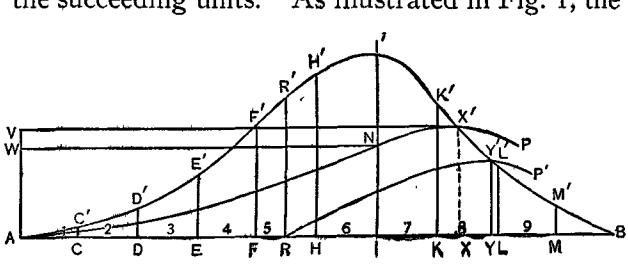

Fig. 1.

product of each succeeding unit is greater than the one preceding it until six units have been expended, after which each succeeding unit may be said to yield a smaller product than the one immediately preceding it.

Indeed it may be true that a law of stationary

returns per succeeding unit operates during the application of a few units, after the final point of increasing return has been reached and before the starting point of diminishing returns per succeeding unit has been reached. It may be true also, that the line $A I'$ in Fig. 1, should rise rapidly with the application of one particular unit, say the fourth, and then remain stationary or even fall with the application of the fifth, and then rise very rapidly again with the application of the sixth. The introduction of drainage or the use of commercial fertilizers might bring such a result. There are at present no data from which to calculate the exact curve which the returns per succeeding unit will follow, but the general rise followed by a general fall is a matter of common observation.

With this illustration (Fig. 1) before us, suppose the farmer has one thousand of these composite units, made up of laborers and capital-goods, to expend in agricultural production. In other words, suppose that this farmer has found that he can secure the largest net profit when he operates just one thousand of these units of labor and capital-goods. With free land at his disposal, how many acres will he use and how many units will he employ upon each acre? Will he apply five units per acre and use two hundred acres of land? No, his expenditures will produce a greater total product when he employs six

units per acre and confines himself to one hundred and sixty-six and two-thirds acres. But will this make the labor and capital-goods *most* productive? On first thought one might answer yes, because the seventh unit adds less to the product than the sixth; but upon looking more closely into the matter, it is apparent that there is no good reason for ceasing to apply more units simply because the point of diminishing returns per succeeding unit has been reached. The seventh unit may add less to the total product than the sixth, and yet add more than any of the first four units, and the *average* product per unit may be greater when seven units have been applied than when only six have been expended. Hence the total product of the thousand units may be greater when seven units have been applied to each acre and only one hundred and forty-three acres of land employed. But at what point should the farmer cease to increase his applications per acre of land? It is obvious that there is a limit, that, for example, a thousand units expended upon one acre of land in the production of Indian corn would yield a smaller return per unit than when more land is used and the number of units applied to each acre more limited. But what is the limit? It is true that in the case before us the sixth unit increases the total product more than any unit before or after it, but *all units cannot be sixth units.* The first, the second, and

the third are indispensable; and, in case a farmer can manage a fixed number of these composite units, made up of capital-goods and laborers, when employed in the production of a given crop without reference to the area on which they are employed, the *highest average return per unit* is the thing which he should seek, for with a fixed cost per composite unit this will enable him to secure the largest net profit per composite unit, consistent with the proper intensity of management, and hence will enable him to secure the maximum total net profit for his exertion.

In the illustration (Fig. 1) the average product per unit is represented as increasing rapidly until the sixth unit has been applied and then less rapidly until a point is reached where the return per increment is just equal to the average. At this point the average return per unit reaches the maximum, and the application of another increment would reduce the average product per unit employed. The thousand composite units are used in the most economical manner when the acreage is so limited that the number of units applied to each acre is just sufficient to yield the maximum average return per unit. For example, the highest average return would be gained by the application of X units in the case before us in Fig. 1, where the location of X is determined by the fact that the rectangle $A\,V\,X'\,X$ is drawn in such a manner that its area equals the

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area $A\ I'\ X'\ X$, which represents the total product of X composite units of the two factors, laborers and capital-goods. That part of the rectangle lying between the line $H\ H'$ and line $I\ I'$, for example, represents the average return per unit. Had the applications stopped at I, after the application of but six units, the total product would be represented by the area $A\ I'\ I$, or the rectangle $A\ W\ N\ I$, and the average return per unit would have been less. Likewise had the applications been increased to nine units, the average return per unit would have fallen. Hence a curve of increasing and diminishing *average returns* may be drawn, based upon the increasing and diminishing returns of the successive composite units of labor and capital-goods. This curve of averages is represented by line $A\ X'\ P$ (Fig. 1) which is so drawn that it will pass through the upper right hand corner of any rectangle which has $A\ C$, $A\ D$, $A\ E$, etc., or any part thereof, as a base and which encloses an area equal to the area $A\ C'\ C$, $A\ D'\ D$, $A\ E'\ E$, etc., respectively, as rectangles $A\ W\ N\ I$ and $A\ V\ X'\ X$ have been drawn in Fig. 1.

As illustrated in Fig. 1, the curve of averages reaches the highest point at X' and the highest average product per unit is gained by employing seven and two-fifths units per acre, and it will be seen at once that, since all the charges which must be deducted are a fixed amount per com-

posite unit of labor and capital-goods applied, the higher the average return per unit, the greater will be the farmer's net profit per composite unit, and under the assumption that, in the production of a given crop, the same amount of managerial activity is required per composite unit without regard to the area of the land on which it is employed, and when there is no rent to pay, the applications should increase until the point of maximum average returns per unit is reached. This is the most extensive agriculture that is consistent with the greatest net profit to the farmer under any circumstances; in the production of a given crop, and, under the above assumption as to demands upon managerial activity, it is the most intensive that is in accordance with the farmer's highest economic interest, where the use of land may be had free.

It has been said[1] that the intensity of culture should be increased until the final increment adds no more to the total product than enough to cover the cost of that unit. If, in Fig. 1, for example, the value of the product represented by a rectangle whose sides are $K\ L$ and $L\ L'$ equals the cost of securing the use of a composite unit, the applications should, according to this view, be increased just to point L. It is true that this would enable the farmer to secure the largest net profit per acre of land, but unless he be a marginal

[1] T. N. Carver, *The Distribution of Wealth*, p. 80.

farmer, in which case the two statements coincide, it would reduce his net profit per composite unit of the other factors. If the farmer were able to operate a given number of acres of land without regard to the degree of intensity of culture, then it would be desirable to secure the largest net profit per acre; but if he can, to advantage, manage only a given number of units of labor and capital-goods regardless of the area on which it is expended, then he should seek the largest net profit per unit of these factors.

It may be well at this point to devote a few lines to the assumption, that, within the limits of the variations in intensity of culture which is likely to exist in the production of a given crop, the same amount of managerial activity is required per composite unit composed of the two factors, laborers and capital-goods, without regard to the area of the land on which it is employed.

In general, we believe this assumption to be very near the truth. In the production of Indian corn, for example, the amount of managerial activity required for each laborer with the team and tools which are used by him would be the same whether thirty acres of the crop were cultivated three times, or the same laborer and capital-goods were used in cultivating twenty-two and one-half acres of maize four times. Certainly if one must choose between this assumption, and the

assumption that the same amount of managerial activity is required for each acre of land, regardless of the intensity of culture, there is little question as to the choice. It is doubtless true that one man can superintend the operations of more laborers and capital-goods when they are brought together under one roof as in a large manufacturing plant than when they are distributed over a vast area of land, but on the farm and in the production of a given crop we believe that, as a rule, the demands upon the time and energy of the manager, per composite unit of the two factors, laborers and capital-goods, will remain practically the same regardless of the area on which such unit is expended. We shall proceed, therefore, upon this assumption in our attempt to ascertain the degree of intensity of culture which is most economical where land has acquired some value so that something must be paid for its use.

When a fixed sum per acre must be paid for its use, land should be cultivated more intensively than when it could be had free. Suppose, for example, that three dollars per acre must be paid for the use of land. We may think of this rent as taking all of the product of the first four and one-half, or R composite units of the factors applied (Fig. 1). In this discussion we shall speak of that share of the product which is left after paying the rent, as a *net return*. The farmer may be said to receive no net return from his expendi-

tures until the rent is paid. Should he cease his applications when R units have been employed, the product would just pay the rent and he would lose the cost of the labor and capital-goods, besides receiving nothing for his trouble. Whatever he produces by further applications is the fund which gives rise to the net profits after the wages of hired laborers and the payment for the use of capital-goods have been withdrawn.

When there is no rent to pay, the farmer seeks the highest average *gross* return per unit of expenditure; but, where a fixed rent must be paid, he no longer seeks the highest average *gross* return, but the highest average *net* return per unit, for, under the assumption that, in the production of a given crop, the amount of managerial activity per composite unit of laborers and capital-goods remains the same regardless of the area on which it is expended, the *largest net return* per composite unit of these factors will enable the farmer to secure the largest net profit per unit of managerial activity put forth, and this is the goal in agricultural production when viewed from the standpoint of the farmer.

The average net return per unit follows the law of increasing and diminishing returns in the same manner as the average gross return; but, when a fixed rent is paid, the line of increasing average net return starts at point R (Fig. 1); for all of the product up to point R is required to pay the

rent, and the average *net* return at that point is zero. After the application of five units the average net return per unit will be represented by one-fifth of the area *R R' H' H;* for the total return minus the rent is represented by the area *R R' H' H,* and since five units have been applied this net return must be divided by five to find the average. Likewise after the application of the sixth unit, it will be one-sixth of the area *R R' I' I.* After the application of the seventh unit, the average will be one-seventh of the area *R R' K' K.* Thus the line of average net returns (line *R Y' P'* in Fig. 1) rises rapidly until the line *I I'* is crossed, after which it rises less rapidly until it crosses the line *I' B,* after which it falls. When a fixed rent is paid, the line of average net returns can never rise so high as the line of average gross returns, and the point *Y'*, where the line of average net returns reaches its maximum distance from the base line *A B,* will always be farther to the right than point *X'*; and hence the highest average net return per composite unit of labor and capital-goods employed on land for which a fixed rent must be paid, will be gained by a more intensive culture than when the same land could be had rent free.

When the farmer follows the rule of seeking the largest net profit for his exertion, the degree of intensity of culture on a given piece of land and in the production of a given crop will vary

with the amount of the fixed rent which is paid for its use,—the greater the amount of rent, the higher the degree of intensity, for when a higher rent must be paid for the use of the land a more intensive culture is necessary if the highest average net return is to be secured.

If the proposition is reversed and we think of successive increments of land being brought under a given number of composite units of the other factors, the simple statement will suffice that the amount of land should be increased until the final increment of land adds just enough to the total product to pay the cost of securing the use of the land.[1] It will readily be seen that this would result in the degree of intensity of culture which will yield the largest net return per composite unit of the other factors. On the assumption, therefore, that one farmer can manage a given number of the composite units of labor and capital-goods without regard to the area on which it is expended, the same conclusion will be arrived at with regard to the proper degree of intensity of culture where land can be had free or where a fixed rent must be paid for its use, whether one adds successive units of the other factors to a given area of land until the average net return per unit reaches the maximum, or whether one adds successive acres of land to a

[1] See *The Distribution of Wealth*, by T. N. Carver, pp. 80-83.

given number of the composite units of the other factors until the final increment of land adds just enough to the total product to pay the fixed rent which must be paid to secure the use of said increment of laid.

The conditions are practically the same if the farmer owns the land which he cultivates as if he pays a fixed rent, the only difference being that he has paid for the perpetual use of the land, whereas the tenant pays annually for its use.

The payment of a share rent does not tend to increase the intensity of culture. The share rent increases as the total product increases; and it may be thought of as taking some fixed portion, say one-third, of the product of each succeeding unit of labor and capital-goods applied, so that the farmer gets only two-thirds of the product of each unit, and his share reaches the highest average return per unit with the same degree of intensity which yields the highest average gross return per unit. Hence, where the share tenants follow their own self-interest, they will farm no more intensively on the best land when less productive grades of land have been resorted to than when only the best grade was cultivated.

To illustrate this point, draw a curved line from *A* to *B* in Fig. 2, at such a distance from lines *A I' B* and *A B* as to leave two-thirds of the area of each section between the lines *A B* and *A I B*. Then draw a line through the points of

average net returns per unit employed, in the same way as the line of average gross returns was drawn. This new line of averages will reach the line of maximum net returns per unit when the line $A\ Z\ P'$ crosses the line $A\ I\ B$. The point Z will be one-third of the distance from X' to X and

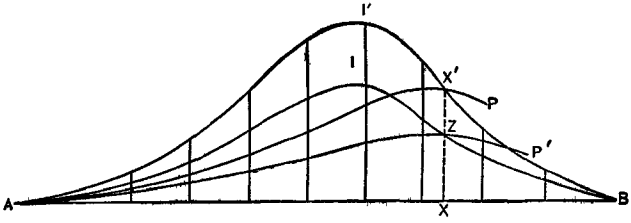

FIG. 2

neither to the right nor to the left. This means that the point of maximum net returns is reached, in the case of a share tenant, with the application of the same number of units which yield the largest average gross product.

Other things remaining the same, how will a change in wages and interest influence the intensity of culture? Suppose that wages and interest fall twenty per cent.; will it then pay the farmer to invest more units per acre? If the rent should remain the same as before the reduction in wages and interest, and if the foregoing reasoning with regard to the proper intensity of culture be true, the degree of intensity in terms of quantities of labor and capital-goods which would yield the largest net return would not change; but the ex-

penditure per acre in value would be decreased and the profits of the farmer would be increased in the same proportion. This higher profit might increase the demand for land, however, and this would likely result in a rise in rents, after which it would pay to increase the quantity of labor and capital-goods employed, excepting in the case of the share tenant.

The influence of a rise or fall in the price for which the product can be sold, will influence the degree of intensity only as it may affect the amount of rent which must be paid for the use of land. As prices rise the rent tends to rise and the degree of intensity should be increased, while the reverse is true in the case of falling prices. This is true because land of a given degree of productivity is limited, and as labor and capital-goods increase in quantity, land of a less productive grade must be resorted to, and without improvements this is possible only when wages and interest fall or prices rise. But there is a close relation between the gross return which the marginal land will yield and the amount of wages and interest which labor and capital-goods can command on other grades of land. This means of course that as the less productive lands are resorted to the rent which the competitors will offer for the better land will rise, and then the largest net return and hence the largest net profit

per composite unit of labor and capital-goods, can be gotten only by more intensive culture.

In this connection the influence of lower wages and lower interest and higher rents, upon the choice of crops, should be reviewed, because it often happens that a rise in rents will result in the change from a crop which requires but little expenditure for labor and capital-goods per acre to one that requires large expenditures per acre.

That degree of intensity of culture which brings the largest net profit to the landowning farmer or to the tenant who has a fixed rent to pay, seems also to be that degree of intensity which makes the total amount of land, labor, capital-goods, and managerial activity employed in the agricultural industry, most productive. It appears, therefore, that at this point there is a harmony of interests between the individual and society as a whole; but it would seem that the interest of the share tenant is not in harmony with the interest of society as a whole in this regard, for if the better grades of land are farmed so extensively as the interest of the share tenant seems to dictate, poorer grades of land would need to be used in order that the labor and capital-goods of the country be employed, and some of this labor and capital-goods on the marginal land would be creating a smaller product than it could be made to yield if employed in farming the better grades of land to a more intensive degree; and,

therefore, while a given share tenant could increase his net profit by this extensive culture, such culture would reduce the total value of the agricultural productions of the country as a whole.

The interest of the share tenant is also out of harmony with that of the landlord in this regard. Since it is to the interest of the landlord that the share which accrues to him as rent shall be as large as possible, he may desire that the intensity of culture be carried to the farthest extreme. So long as an increment of expenditure will add anything to the product it might seem to his interest to have the increment applied, for it would add to his income. Thus, stated in its extreme form, it would seem that while the share tenant would desire to farm so extensively that the average gross return per unit of labor and capital would reach the maximum, the landlord might desire that the gross return per acre should reach its absolute maximum, without regard to cost per unit of the product.

It is evident that the interest of the landlord as well as that of the share tenant is here in conflict with the interest of society as a whole; for to follow what seems to be the landlord's highest economic interest in this particular, would result in the reduction of the total agricultural product which could be produced with a given amount of social energy.

But it becomes apparent that the landlord will

always be unable to induce his share tenant to farm any more intensively than an owner of land or a tenant with a fixed rent finds it to his interest to farm his land, for the tenant could otherwise do better by paying a cash rent or by taking up new land of nominal value. On the other hand, the share tenants are, in the United States, quite generally under the direct supervision of the owners of the land, who insist that the share tenant should farm as well as the owner would do. It may be true that this ideal is not often perfectly attained, and yet the tendency is for the landlord to so bring his influence to bear upon the share tenant that the social loss due to share tenancy is, perhaps, not very great. Yet this conflict between the interest of the landlord and that of his share tenant is a factor which becomes more and more difficult to adjust as land values rise.

LITERATURE

T. N. Carver, *The Distribution of Wealth,* Chapter II.
Wilhelm Roscher, *Nationalökonomik des Ackerbaues,* Book II, Chapters II and III.

PROBLEMS IN AGRICULTURAL ARITHMETIC

BASED UPON AND INTENDED TO ILLUSTRATE THE FOREGOING PRINCIPLES

Suppose that a farmer who employs labor and capital-goods of a given grade in the production of maize should find by experimentation, that, with wages, wear and tear, interest and other elements which must be taken into

account in figuring the cost of using capital-goods, as they were at a given time, the following varying expenditures would yield the corresponding varying results.

Dollars per Acre	Bushels per Acre in Field A	Bushels per Acre in Field B
1	0	0
2	0	2
3	0	6
4	0	15
5	10	28
6	25	37
7	38	42
8	48	46
8.2	49.1	46.6
8.4	50.2	47.1
8.6	51.3	47.5
8.8	52.3	47.8
9.0	53.2	48.0
9.2	54.1	48.2
9.4	54.9	48.4
9.6	55.7	48.6
9.8	56.5	48.8
10.0	57.0	49.0
11.0	60.0	49.5
12.0	62.0	49.8
13.0	63.0	50.0
14.0	63.5	50.1
15	63.5	50.1

PROBLEMS

(1) Supposing that the farmer could get all the land he cared to use, rent free, either of the quality found in Field A or Field B; which kind of land would it pay him the better to use?

(2) When maize is worth 25 cents per bushel and a rent of $2.50 per acre is charged for the land of either grade, which grade would prove the more profitable to the farmer, and to what degree of intensity should he cultivate it?

(3) In case the farmer must give one-third of the crop

to the landlord, as rent, to what degree of intensity would he farm each of the fields, A and B, if he followed his own highest economic interest? To what degree of intensity if he followed the highest economic interest of the landlord? Explain fully how society as a whole would lose in either case.

(4) When maize is worth 35 cents per bushel and the rent which must be paid for the use of the land in Field A is $5.00 per acre, what is the highest rent which the farmer could afford to pay for the use of the land in Field B?

(5) How would a rise of 20 per cent. in the cost of labor and capital-goods affect the above problems?

(6) How would the second problem (2) be affected if the price of corn should rise to 40 cents per bushel and the rent should at the same time rise to $4.00?

(7) How would problem three (3) be affected if the landlord should agree to take twelve and one-half bushels of maize per acre instead of one-third of the crop?

(8) Suppose that the rent of the land is $2.50 per acre and that with this rent the highest average net return per dollar's worth of labor and capital-goods is gained in the production of maize when $8 is expended per acre, and in beets when $32 is expended, and that the maize crop is worth $15 per acre, and the beets are worth $48 per acre, and further that the farmer can manage four times as many acres of maize as of beets and that the two crops are equally beneficial to the soil; which of the two crops would prove the more profitable to the farmer?

(9) Suppose that the rent rises to $5 per acre, the expenditure on maize to $9 and that on beets to $36, and that the maize crop is then worth $16.25 per acre, and the beet crop $53 per acre; which would then prove the more profitable crop to the farmer?

(10) How would the 9th problem have been affected if the price of maize had risen ten per cent. without any corresponding change in the price of the beets?

CHAPTER VII

THE SIZE OF FARMS. THE ECONOMIC PRINCIPLES WHICH DETERMINE THE SIZE OF FARMS; THE SIZE OF FARMS IN VARIOUS COUNTRIES.

Section I. The economic principles which determine the size of farms.—The amount of land which a farmer should attempt to operate, in order that he may win the largest total net profit, depends upon many varying conditions: the kinds of crops which he grows; the intensity of culture; the character of the horses, the tools, and the machines which he uses; the number and character of the laborers which he employs; and the efficiency of the farmer himself, are all important factors in determining the size of the farm which is most economical.

Where tobacco or sugar beets are cultivated, one man cannot operate so large a farm as where maize is the principal crop. In the tobacco districts of Dane County, Wisconsin, farms have decreased in size in recent years; while in the dairy districts they are larger now than fifteen years ago. In New England, where mixed or grain farming has been unprofitable for the last twenty-five years, some regions have, in recent years, been devoted

to dairying, and others to fruit growing. Where fruit-growing has replaced the old agriculture farms are smaller than formerly. Where dairying has been generally introduced the average farm is larger than before the change.

Since intensive culture requires more labor upon a given area of land, it is impossible for one man to cultivate so many acres where the culture is intensive as where it is extensive. In new countries, where land is relatively abundant, extensive culture is generally most profitable and the average size of farms is usually greater than in older countries where land is scarce, land values very high, and intensive culture most profitable.

A farmer can use more land when he has the most efficient forms of capital-goods with which to work. The fact that five times as many men are often employed upon a given area of land in England as upon the same area in the United States is not explained wholly by the difference in the degree of intensity of culture in the two countries. The American farmers have, as is well known, much more and better labor-saving machinery than do the English.

The efficiency of the farmer is an important factor in determining how much land he can use to best advantage. The energetic man, whose clear head and strong arms enable him to plan his work most economically and to do it quickly, can operate a much larger farm than his neighbor who

may be characterized by the opposite qualities. This may happen as a result of variations in the quantitative efficiency even where the farmers perform most all of the work themselves; but the farmer who is qualitatively very efficient as a manager of agricultural operations, can increase his total net profits by operating a large farm by means of hired laborers who may have little managing ability themselves, but who have ordinary capacity for the performance of farm labor when directed by an efficient farmer. The kinds of crops, the intensity of culture, the efficiency of the capital-goods and of the farmer himself remaining the same, the greater the number of laborers, of a given degree of efficiency, who are employed by one farmer the larger the farm may be to advantage. A question may arise as to how far this increase in the number of laborers, and the accompanying increase in the size of farms, should be carried in order that the farmer shall win the largest net return for his efforts, and also as to the desirability of large farms socially considered.

If a farmer possesses superior managing ability, so that it is profitable for him to devote all of his time and energy to the management of a farm, employing laborers to perform all of the detailed operations, how large a farm should he attempt to operate? The farmer should look, of course, to the net profit which is left after the pay-

ment for the use of the land and capital-goods, and the payment of the wages of hired laborers have been made.

Having decided upon the branch of agriculture which he is to follow, the grade of land, capital-goods, and laborers which he is to employ, the kind of crops which should be grown, and the proportions in which these factors should be brought together and the amount of managerial activity which should be devoted to each unit, the farmer has yet to determine how many of these composite units he should attempt to manage.

If the farmer could increase the number of these composite units indefinitely without any increase in the work of management, and, at the same time, without any reduction in the quality of the management, and hence, without any reduction in the average net return per composite unit, there would be no limit to the size of the farm nor to the total net profit which he could win. This is, of course, impossible. The supposition is made to emphasize the fact that it is the increased amount of effort which the farmer must put forth, and the tendency towards a decline in the efficiency of his management after the farm has reached large proportions, which set the limit to the size of the farm.

The principle which should be followed in attempting to determine the number of composite units made up of the proper proportions of land,

labor, and capital-goods, which should be brought under a given amount of managing activity, has already been considered in the preceding chapter and we shall now consider, therefore, the conditions which set the limit to the quantity of managerial activity which a farmer will expend and which ultimately determines the size of the farm.

Having decided upon the number of the composite units of the factors which should be brought under a given amount of managerial activity, that is the intensity of the management, other things remaining the same, the size of the farm should vary directly as the amount of effort which the farmer is willing to put forth in its management. The farmer's energy is, of course, limited, and after he has performed a given amount of work per day, it requires more and more inducement to impel him to increase his activity. It may be that a few hours of work each day would be a pleasure to him, and that the profits which he received from these few hours' labor would be much more than enough to induce him to perform the work of management; but when hour after hour is added to the time which he must spend in the fields, and the rapidity of his movements from place to place must be increased more and more, in order that the farm may be properly operated, each succeeding addition to the time and the speed of his work becomes more and more wearisome, while at the same time the

wants which are to be satisfied by the fruits of this increased labor become less and less important to him, until finally the point is reached where the increase in the net profit is not sufficient to induce the farmer to increase his activity.

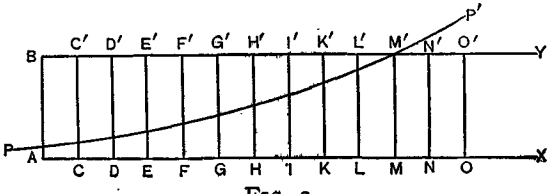

FIG. 3

This can be illustrated by means of a diagram. In Fig. 3 the succeeding composite units of the agents are measured on the base line *A X*, and the net profit which the farmer receives for managing these units is represented by the area between this line and the line *B Y*, so that the area *A B C' C*, for example, represents the net return from one of the composite units. If the idea of a composite unit seems too abstract to the reader, he may think of one of these units of the agents of production as one laborer and the amount of land and capital-goods associated with him. That share of the net profit per unit which is represented by the area lying below the curved line *P P'* may be thought of as the amount which is required to yield to the manager a pleasure in consumption goods equal to the net pain of performing the work of management. Assuming

that he devotes exactly the same care to each unit, as he continues to increase the number of units, the perpendicular distance between lines $A\ X$ and $B\ Y$ will remain constant; but a larger and larger proportion of the net profits of the succeeding units will be required to counterbalance the pain or dis-utility accompanying the added exertion, required for the management of such units, hence the curve $P\ P'$ will gradually rise until at some point it will cross the line $B\ Y$, at which point the farmer will cease to increase the size of his farm.

Which is the most desirable from the social point of view, the large, the medium, or the small farms? Having in mind that farmers vary greatly in their degrees of efficiency, it would seem socially desirable to have the managing done by the most efficient farmers; for in this way the labor would be under more efficient direction, than where every man directs his own activities. Another advantage of large farms lies in the fact that they facilitate a more extended division of labor. There can be a shepherd who devotes all of his time to the sheep, and for this reason he can better understand his business. So it is in every line of work on the large farm. Machinery can be used to better advantage on the large farm. The efficient manager of the large farm can better determine what will pay and what will not pay, so that he is in a much better position to direct the labor

power of society to the best advantage. The man who is toiling in the field as well as managing the farm is less likely to be far-sighted at a time when he is tired, and at such times he may sacrifice much of the profits for a relatively small saving of labor.

On the other hand what improves the efficiency of the management in this way may lower the quality of the workmanship. There are some men, it is true, who seem to work better for others than for themselves, but with many others, the opposite is true. There are vast numbers of small farmers who do not use good methods, who, because of their interest in that which is their own, will put forth greater effort than they would if they were working for some one else.

It has been said that certain kinds of farming lend themselves more readily than others to large scale operations; that wheat farming, for example, is especially suited to large scale operations, but that as this one crop system gives way to diversified farming, the advantages of smaller farms assert themselves. The owner of young stock takes more pains with them than he would if he were a hired laborer. It is certainly true as a general rule that the man who owns the lambs or pigs will lose more sleep and go to more trouble than will a hired man. "He that is an hireling, and not the shepherd, whose own the sheep are not, seeth the wolf coming, and leaveth the sheep,

and fleeth: and the wolf catcheth them, and scattereth the sheep. The hireling fleeth, because he is an hireling, and careth not for the sheep."[1]

The management of a farm is something which must be diffused through the details of the work. There is a withdrawal of the efficient manager's ability from the details and a concentration of it upon the general supervision of the farm as the size of the farm increases. As more and more of the details are delegated to hired men these details are not looked after so well as they might be if looked after directly by the master. Cato, a Roman agricultural writer, says, "Neither the assiduity and experience of the hired manager, nor the power and willingness of the master to lay out money in improvements, are so effectual as this one thing, the presence of the master; which, unless it is frequent with the operations, it will happen to him as in an army when the general is absent; all things will be at a stand."[2] And, again, Pliny says, "The ancients were in the habit of saying, that it is the eye of the master that does more towards fertilizing a field than anything else."[3]

The question of the most desirable size of farms, when viewed from the standpoint of the

[1] *Gospel of St. John*, Chapter X, verses 12 and 13.

[2] Adam Dickson, *The Husbandry of the Ancients*, Vol. I, p. 200.

[3] *Natural History*, Book XVIII, Chapter 8, Bohn's edition, Vol. IV, p. 17.

most economic use of the productive energies of a country, is a matter of determining the point at which the advantages of the more efficient general supervision as to crops, field-systems, intensity of culture, etc., is balanced by losses in the execution of the details of the work with less skill and personal interest.

The conclusion is, therefore, that every man who can make more by hiring to a farmer should do so, and every farmer who can increase his net profits by hiring men and increasing the size of his farm, without increasing the amount of effort which he need put forth, should do so. Each man would then get the largest net income, and the value of the agricultural productions of the country would reach the maximum.

But the actions of men are not controlled entirely by economic motives. There is a pleasure to be derived from being one's own master, which is often prized more highly than many of the things which money can buy. As a result many men remain independent farmers when they could secure a larger income for themselves and add more to the value of the agricultural productions of the country by being hired men under the direction of more efficient managers. And yet it may be that this economic loss is compensated for in the social gain that comes from self-directed activity.

The proper size of farms is a subject which has

commanded the attention of agricultural writers since ancient times. "The ancients," says Pliny, "were of opinion, that, above all things, the extent of farms ought to be kept within proper bounds. Wherefore it was a maxim amongst them, to sow less and plow better. Such, too, I find, was the opinion entertained by Virgil, and indeed, if we must confess the truth, it is the wide-spread domains that have been the ruin of Italy, and soon will be that of the provinces as well. . . . With that greatness of mind which was so peculiarly his own, and of which he ought not to lose the credit, Cneius Pompeius would never purchase the lands that belonged to a neighbor."[1]

Columella, another Roman agricultural writer, also taught moderation in the size of farms. "To the other precepts," says he, "we add this, which one of the seven wise men has pronounced as a maxim, that holds true in all ages, that there ought to be limits and measures of things; and this ought to be understood, as applied not only to those that do any other business, but also those that buy land, that they may not buy more than they are fully able for. To this is applicable the famous sentence of our poet, *You may admire a large farm, but cultivate a small one;* which ancient precept this most learned man [Virgil],

[1] *Natural History,* Book XVIII, Chapter 7. The first part of this quotation is taken from the translation as given by Adam Dickson, *Husbandry of the Ancients,* Vol. I, p. 193; the latter part is from Bohn's edition, Vol. IV, pp. 14 and 15.

. . . . expresses in numbers. This, too, is agreeable to an acknowledged maxim of the Carthaginians, a very acute nation, *That the land ought to be weaker than the husbandman;* for, when they struggle together, should the farm prevail, the master must be ruined. And, indeed, there is no doubt, that a small field well cultivated produces more than a large field ill cultivated."[1] "Among the maxims of the ancients, recorded by Palladius," says Dickson, "there is one to the same purpose with that mentioned by Columella, 'A small farm cultivated is more fruitful than a large farm neglected.' "[2]

Section II. The size of farms in various countries. A. The size of farms in the United States. —The total number of farms in the United States in 1900 was 5,739,657. The total area of these farms was 841,201,546 acres. The average area per farm was 146.6 acres, and the average number of improved acres per farm was 72.3. In the following table is given the number of farms of the various sizes, the percentage of the area of farm land in each class, and the percentage of all farms in each class.

[1] Adam Dickson, *Husbandry of the Ancients,* Vol. I, pp. 195 and 196.

[2] *Husbandry of the Ancients,* Vol. I, p. 198.

TABLE I. THE FARMS OF THE UNITED STATES CLASSIFIED ACCORDING TO SIZE.[1]

Classes of Farms	Number of Farms	Percentage of Improved Area	Percentage of All Farms
Under three acres.....	41,882	.02	.7
3 acres and under 10....	226,564	.30	4.0
10 " " " 20....	407,012	1.23	7.1
20 " " " 50....	1,257,785	7.96	21.9
50 " " " 100....	1,366,167	16.23	23.8
100 " " " 175....	1,422,328	28.54	24.8
175 " " " 260....	490,104	15.24	8.5
260 " " " 500....	377,992	17.44	6.6
500 " " " 1000....	102,549	7.11	1.8
1000 " " over.....	47,276	5.92	.8
Total	5,739,657	100.00	100.0

From Table No. 1, it will be seen that a very large proportion of the farms of the United States (70.5 per cent.) fall into the three classes of farms ranging from twenty to fifty, fifty to one hundred, and from one hundred to one hundred and seventy-five acres respectively. With regard to the geographical distribution of the farms of the various sizes it was shown by the census returns for 1900 that small farms ranging from twenty to fifty acres were most abundant in the southern states, the percentage in this class in the South Atlantic division being 27.6, and 30.1 in the South Central division, as compared with 21.9 for the country as a whole. Farms ranging from fifty to one hundred acres in extent are relatively most abundant in the North Atlantic division,

[1] *Twelfth Census*, Vol. V, Tables 1 and 5.

where the percentage belonging to this class is 28.3, as compared with 23.8 for the country as a whole. Farms containing from one hundred to one hundred and seventy-five acres are relatively most abundant in the North Central division, where the percentage is 29.9 as compared with 24.8 for the country as a whole. This same division contains, also, the highest proportion of farms ranging from one hundred and seventy-five to two hundred and sixty acres in size, the percentage being 11, as compared with 8.5 for the country as a whole. The farms containing two hundred and sixty acres and over were relatively most abundant in the Western division, the percentage there being 23.6 as compared with 9.2 for the United States as a whole.

It may be said with respect to the kind of agriculture which prevailed on the farms of the various sizes that the census returns for 1900 show that on the farms which contained one hundred acres or more the principal sources of income were, in the vast majority of cases, hay, grain, and live stock. While on farms ranging from ten to fifty acres the principal source of income was more often cotton than any other one product. This corresponds with the fact that small farms ranging from twenty to fifty acres in extent are most abundant in the southern states. It corresponds also with the fact that about half of the farms on which cotton is the principal product,

are operated by negroes and that farms operated by negroes are usually comparatively small, about nine-tenths of the negro farmers having been found to occupy farms of less than fifty acres in extent.

Small farms in the cotton belt have not always been so common, as is shown by the rapid decline in the average size of farms in the southern states since 1860. In the South Central division where the decline in the size of farms has been most marked, the average number of acres per farm was 321.3 in 1860, and 155.4 in 1900. This is the result of replacing the plantation system with the tenant system after the slaves had been emancipated. The questions of the labor supply and the size of farms are here closely associated. It may well be questioned if the change from large to small farms in the production of cotton has been of any economic advantage either to the farmers or to the country as a whole.

B. The size of farms in England.[1]—There were 380,179 farms ("agricultural holdings") in England in 1895. These holdings, or farms, contained in the aggregate, 24,844,688 acres of improved land, that is, land under crops, bare fallow, or grass. The average number of improved acres per farm was, therefore, slightly more than sixty-five. These figures include all of the hold-

[1] Board of Agriculture, Returns as to the number and size of agricultural holdings in Great Britain in the year 1895, *Parliamentary Papers*, C.—8243, p. 3.

ings of agricultural land above one acre in extent. The following table shows the number of farms of the various sizes and the percentage of the total improved area of farm land which is found in each class of farms.

TABLE 2. THE FARMS OF ENGLAND CLASSIFIED ACCORDING TO SIZE, WITH THE PERCENTAGE OF THE TOTAL IMPROVED AREA FOUND IN EACH CLASS, ACCORDING TO THE RETURNS FOR 1895.[1]

Classes of Farms	Number of Farms	Percentage of Improved Area
Above 1 acre and not exceeding 5..	87,055	1.07
" 5 acres " " " 20..	108,145	4.87
" 20 " " " " 50..	62,446	8.36
" 50 " " " " 100..	46,574	13.70
" 100 " " " " 300..	60,381	42.00
" 300 " " " " 500..	11,112	16.86
" 500 " " " " 1,000..	3,942	10.35
" 1,000 "	542	2.79
Total	380,179	100.00

C. The size of farms in Germany.[2]—The total number of farms in Germany in 1895, was 5,558,317. The total area in these farms was 106,913,313 acres, so that the average size of farms was 19.2 acres. Under the term *Betrieb,* which may be translated *farm,* is included every piece of land large or small which is used for agricultural purposes and which is cultivated or managed directly

[1] Board of Agriculture, Returns as to the number and size of agricultural holdings in Great Britain in the year 1895, *Parliamentary Papers,* C.—8243, p. 3.

[2] *Statistik des Deutschen Reichs,* Neue Folge, Band 112, Erster Abschnitt, *Die landwirthschaftlichen Betriebe.*

by one man. When all farms are excluded which are less than one hectare or 2.47 acres, the average size is nearly doubled, being 34.37 acres. Yet these general averages would be considerably reduced if the waste lands were counted out, as only seventy-five per cent. of the total area of farms is reckoned as cultivated land, that is, land used as cultivated fields, gardens, meadows, rich pastures, orchards, and vineyards. In the following table is given the number of farms of the various sizes, and the percentage of the total area in farms, which is found in each class.

TABLE 3. THE FARMS OF GERMANY CLASSIFIED ACCORDING TO SIZE, 1895.

Classes of farms	Number of farms	Percentage of total area in farms
Less than 2.47 acres	2,529,132	2.63
2.47 to 12.35 "	1,723,553	12.52
12.35 " 49.42 "	998,804	28.96
49.42 " 123.55 "	239,643	21.86
123.55 " 247.10 "	42,124	8.54
247.10 " 494.20 "	11,250	5.43
494.20 " 1235.50 "	9,631	9.75
1235.50 " 2471.00 "	3,608	7.63
2471.00 acres and over	572	2 68
Total....	5,558,317	100.00

— Eastern Germany is a land of large farms. In the southwestern part very small holdings prevail, while in the northwest and in the south medium-sized farms are most common.

D. The size of farms in France.[1]—In 1892

[1] Flour De Saint-Genis, *Propriété Rurale en France*, Chapter II.

there were 5,702,752 farms in France. The area in farms (exploitations) was 122,015,015 acres. The average size of farms was 21.4 acres. But when we exclude all farms which are less than 2.47 acres (one hectare) the number of farms is reduced to 3,467,347, while the acreage is reduced only to 118,735,256 and the average is increased to 34.2 acres per farm. This is the total area, which is, of course, greater than the cultivated area. The following table will be of interest, as it is comparable to those for Germany, England, and the United States.

TABLE 4. THE FARMS OF FRANCE CLASSIFIED ACCORDING TO SIZE, 1892.

Classes of farms	Number of farms	Percentage of the total farm area
Less than 2.47 acres	2,235,405	2.7
2.47 to 12.35 "	1,829,259	11.1
12.35 " 24.71 "	788,299	11.7
24.71 " 49.42 "	429,407	
49.42 " 74.13 "	189,664	29.0
74.13 " 98.84 "	92,047	
98.84 " 123.55 "	53,343	
123.55 " 247.10 "	52,048	
247.10 " 494.20 "	22,777	45.5
494.20 " 741.30 "	6,223	
741.30 acres and over	4,280	
Total....	5,702,752	100.0

It is interesting to compare these tables, and note the close resemblance between Germany and France with respect to the size of farms, and then to note that the average for England is much greater. It would be exceedingly interesting to

study the history of land tenure in these three countries with a view to determining to what extent social institutions have determined the size of farms and to what extent these variations between England and the continent may be due to different economic conditions.

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CHAPTER VIII

THE FORCES AND CONDITIONS WHICH DETERMINE THE PRICES OF AGRICULTURAL PRODUCTS.

It has been seen that one of the most important factors in determining which crops should be selected for the field-system and the degree of intensity with which these crops should be cultivated, is the price for which the produce can be sold. The question arises, therefore: What are the forces and conditions which determine the prices of agricultural products?

The business man explains prices in terms of demand and supply; and while it will be impossible in a work of this kind to enter into the philosophy of value, it may be worth while to devote a few lines to the significance of demand and of supply. Behind the fact of demand is the more fundamental fact of human wants. The desire to satisfy wants impels men to produce supplies of utilities. The effort which man must put forth in order to gain the means of satisfying his wants sets a limit to the supply of valuable utilities or economic goods as they are sometimes called. It usually happens that long before all of the wants of a man

are satisfied, the pain of exertion becomes great enough to more than balance the possible pleasure which might be produced by consuming the products of further exertion. So long as there is an unsatisfied desire for an article, that article will have some value placed upon it. The relative intensity of the buyer's desire for an article determines how highly he will value it, and what price he will be willing to pay for it; but the price which must be paid determines how completely the want will be satisfied,—the higher the price the more intense will be the desire which will be left unsatisfied.

On the other hand the natural facilities for increasing the supply will determine how high the price must be before the producer can afford to increase the supply. Marshall says: "For long periods the supply price is that which is just needed to call forth those new investments of capital, material and personal, which are required to make up a certain aggregate volume of production."[1] The lower the price at which the producer can, with profit, add an increment to the supply, the greater the total supply that will be put upon the market and the more generally it will be consumed; but the greater the amount of an article consumed, the less intense is the desire for it and the less highly it is valued. Thus it is that the *marginal utility,* or the intensity of the last want

[1] Alfred Marshall, *Principles of Economics,* third edition, p. 448.

which is satisfied tends to adjust itself to the cost of producing that share of the supply which is produced under the most unfavorable circumstances. But it is also true that the price which is offered at a given time, and which corresponds to the marginal utility at that time, determines the maximum amount which can be expended in the production of a given article with profit and hence determines ultimately how far down the scale of less and less favorable circumstances its production can be carried on. Thus it is that the forces which lie behind the demand for an article, and the conditions under which the article may be supplied, regulate its price.

Let us apply this principle to a concrete case by asking the question, "What determines the price of wheat?" The value which the wheat consumers will place upon wheat is determined by the intensity of their desire for wheat bread; but the intensity of that desire varies with the amount per capita they are consuming from day to day. The more they consume each day, the less intense the desire for wheat, and the lower the price which the consumers are willing to pay for it. But, again, the less the consumers are willing to pay, the fewer are the farmers who can introduce wheat into their field-systems with profit, and the smaller the supply will tend to become. Thus it is that the price rises when the demand increases relatively to the supply, and falls when the sup-

ply increases relatively to the demand, the price always being such as will form an equilibrium between demand and supply.

Wheat can be shipped anywhere in the world, so that it is the wheat crop of the whole world, and the demand of the entire population of the earth for wheat, that must be taken into account in any attempt to work out the conditions which determine the price of wheat at any given time. Many countries produce more wheat than they can consume, while other countries draw a part of their supply from abroad every year. The most important countries having a wheat surplus are: the United States, Canada, Argentina, Chile, Uruguay, Austria-Hungary, Bulgaria, Rumania, Russia, Turkey, British East Indies, Australasia, and North Africa. The most important wheat-importing countries are: Great Britain, Belgium, Denmark, France, Germany, Greece, Italy, Netherlands, Portugal, Spain, Norway and Sweden, Switzerland, Japan, and China.

Wheat is sent from the United States to Europe, where it competes with wheat brought from India. Wheat is sent from India to China and Japan and there meets the product of the great wheat farms of California, Washington, and Oregon. Thus we see that the commerce in wheat is world-wide and the price of wheat is determined by the supply and the demand upon a market which is world-wide. Hence it should not be ex-

pected that the price of wheat will vary inversely as the yield in any one country; for the wheat producing countries are scattered widely over the surface of the earth, and the conditions which reduce the crop in one country may not be present in other countries, and hence a short crop in one country is often made up for by an unusually large one in another country.

The price of wheat tends to equal the cost of producing and bringing to the central market that portion of the wheat which is produced and marketed under the most unfavorable conditions,—the competition of crops as well as natural conditions being taken into account. This means, simply, that if the intensity of the desire for wheat increases a higher price is likely to be offered for wheat and it will become profitable to extend its culture under conditions where this crop was formerly unprofitable; and the tendency is to extend its culture to the point where the costs will equal the price under the most unfavorable conditions of wheat production, which may be interpreted as meaning wheat produced upon the least productive wheat land by the least efficient farmers which are capable of competing in wheat production. If the price falls, some of the land which has been used for wheat production can no longer be used for this purpose with profit. Consequently some of the farmers who at the higher price could make a living by producing wheat could no longer do

so, and some of the supply would be cut off. Thus it is that agriculture must ever be adjusted to the changes in the prices of the products.

There are certain products which can be substituted for each other and thus tend to keep prices from rising so high or sinking so low as they otherwise might. Rye bread, for example, is consumed very largely in northern Europe, and when the rye crop is larger, and the wheat crop smaller than usual, more rye bread and less wheat bread is consumed. When the rye crop is smaller than usual, there may be a larger wheat crop to balance the shortage in rye. Thus, it is the world's supply of wheat and wheat substitutes, and the world's demand for bread and bread substitutes, that fixes the price of wheat on the world's market at any given time.

Liverpool is the center of the world's wheat trade, and the conditions which regulate the price of wheat on the Liverpool market may be said to regulate the price throughout the world. More wheat is produced in the United States than is consumed at home. The surplus of the great wheat producing states is brought together at the "primary" grain markets,[1] the most important of which are: Chicago, Minneapolis, Duluth, Superior, St. Louis, Milwaukee, Toledo, Kansas City, Peoria, Cincinnati, and Detroit. From these primary markets, wheat and its products are sent

[1] Report of the Industrial Commission, 1900, Vol. VI, p. 45.

to the various parts of the United States, where wheat is not produced in sufficient quantities to supply the demand. But after all of the deficit areas of the United States are supplied, a large surplus still remains, which is sent abroad.

The price of wheat in any primary market will equal the price in Liverpool minus the charges made for putting the wheat on the Liverpool market. The local price at any point in the surplus-producing regions will equal the price at the nearest primary market minus the charges incident to putting the wheat on that market. The local price of wheat or its products at any point where less is produced than is consumed will equal the price in the nearest primary market plus the charges made for bringing the wheat or wheat product from that market. The charges made for transporting and handling the grain have been spoken of, rather than the cost of transporting and handling the grain, for the reason that it is not certain that the charges are exactly the same as the costs to the transportation companies and the wheat merchants, and yet if the companies and the merchants are able to charge more than sufficient to pay all costs this becomes as important in determining the price as if it actually cost the company more to give the services.

The circumstances are somewhat different in the case of maize. The United States is the principal maize producing country, and nearly the

whole crop is consumed at home. Over three-fourths of the maize crop is consumed in the county where grown. Only one-fifth of it enters into the internal commerce of the country, and from five to ten per cent., only, enters into foreign distribution. Maize is used largely for the feeding of stock. From year to year farmers count on selling about so many fat cattle and hogs, and it is for this purpose that most farmers grow maize. When the crop is short, as in 1901, the shortage here is not balanced, as it is apt to be in the case of wheat, by good crops in other countries, because there is no country which ships maize to the United States in appreciably large quantities.

The demand for pork is fairly regular and so is that for fat cattle, and the result of a short maize crop shows itself at once in the price of maize and only less directly in the price of pork and beef.

But the difference between maize and wheat with respect to the price-determining conditions in the United States is only one of degree. This country is an exporter of maize in ordinary years and any relatively small increase in the size of the American maize crop may be balanced by a short crop in some of the other countries which compete upon the European market.

The potato market is still more local than that for maize. Each locality is more dependent upon the local supply and the price is influenced much more by variations in the yield of the local

crop than in the case of maize and wheat. Some regions are regularly wheat sellers, others wheat buyers, from year to year; but in the case of potatoes, the aim of the vast majority of the producers is simply to supply their own wants or to meet the demands of the local markets, and the same region may have a surplus one year and a deficit the next. The cost of shipping potatoes is a larger percentage of their total value than in the case of wheat, and as the surplus of one year cannot be kept until the next, the local price will be relatively low in case there is a surplus, while in case of a deficit the local price will be relatively high. Clover seed is a good example of a very uncertain crop, and it is well known that, for this reason, the price of this article fluctuates very greatly from year to year.

The prices of the animal products of the farm must necessarily sustain some more or less definite relation to the prices of the crops on which the live stock industry is based. In general it is true that in a country where grazing lands are abundant and where the prices of hay and grain are low, the prices of cattle and dairy products will be lower than in a country like England, where grazing lands are scarce and feed stuffs are dear.

When long periods are taken into account, the general principle seems to hold true in any single country that a rise in the price of feed stuffs will result in a rise in the prices of animal products.

The price of Indian corn on the Chicago market reached its lowest figure for the twelve years from 1892 to 1903, in September, 1896, when it was 19.5 cents per bushel. The minimum price of hogs on the same market for the same period was likewise reached in September, 1896, when the lowest was $2.45 per 100 lbs. On the other hand, the highest Chicago price of maize for this period is given at 88 cents per bushel, which price was reached in July, 1902, and it was in the same month of that year that the price of hogs on the Chicago market rose to $8.75 per 100 lbs., which is the highest price quoted in that market for the twelve years under consideration.[1]

But when shorter periods are taken into account, a rise in the prices of feed stuffs is often accompanied by a fall in the prices of the live stock which is dependent upon this food supply. It is a matter of common observation among farmers that if there is a great abundance of grain, hay, and forage crops available in the fall of the year, there is usually a great demand for "stock cattle," and there is no rush about marketing the fat cattle which are intended for the market. As a result, the prices of cattle are relatively high in comparison with the prices of the materials on which they are fed. Again when a dry summer cuts the crops short, so that the number of cattle which should be kept through the winter is very

[1] See table appended to this chapter.

great in comparison to the stores of feed, many farmers find it necessary to sell some of their cattle rather prematurely and at a very low price. Under these circumstances the prices of "stock cattle" are likely to show a greater rise or fall inversely to the prices of the feed stuffs, than are the prices of fat cattle and dairy products.

While it is true that the prices of hogs and of maize reach their highest level in the same month and likewise their lowest level in the same month, it is also true that the prices of hogs tend for a time to fall when the price of maize rises. In 1901, a year when the maize crop was short, the average monthly price of maize rose from 56 $\frac{5}{16}$ cents per bushel in September, to 65 cents in December, during which time the average monthly price of hogs fell from $6.60 per 100 lbs., in September, to $6.27½ in October, to $5.65 in November, but rose to $6.00 again in December, so that in the five months the price of hogs fell 60 cents per 100 lbs., while the price of maize rose 8⅜ cents per bushel.[1] This situation is doubtless to be explained in part by the fact that the number of hogs to be fed was relatively great when compared with the amount of maize available for feeding purposes, and as a result the hogs were rushed

[1] See the high and low monthly prices for Indian corn and for hogs for the whole year 1901, as given in table appended to this chapter.

to the market so soon as they would be accepted at any price.

This conclusion seems to be confirmed by the fact that while there were 56,982,142 hogs on farms January 1, 1901, there were but 48,698,890 on January 1, 1902. This relation between the prices of maize and of hogs during the last five months of 1901, may be explained in part, however, by the fact that the supply of marketable maize was much smaller than the total number of bushels produced in the country, for the reason that much of the crop did not mature properly. A considerable proportion of the crop could not be put upon the market and that which was marketable commanded a high price, while that which could not be sold could not be kept for any great period in the crib without deterioration, hence it was rapidly fed out regardless of the high price of maize upon the market.

Perhaps sufficient has been said to impress the careful reader with the fact that the so-called law of demand and supply is but a very general statement of the price-determining phenomena, and that the conditions and forces which lie beneath demand and supply are exceedingly various and complex.

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APPENDIX TO CHAPTER VIII

The wholesale prices of Indian corn per bushel, and of hogs per 100 lbs., on the Chicago market, from January, 1895 to February 1905, giving the highest and the lowest price for each month.[1]

Date	Indian Corn No. 2 Low	Hogs Low	Indian Corn No. 2 High	Hogs High
1895	Cents		Cents	
January.....	40½	$3.70	46	$4.80
February.....	40⅝	3.60	43½	4.65
March.....	42⅞	3.85	45¾	5.30
April.....	44¾	4.40	48	5.40
May.....	46⅞	4.10	54¾	4.975
June.....	46⅞	4.20	53⅛	5.10
July.....	41¾	4.50	47½	5.70
August.....	36¼	3.85	44½	5.40
September...	30¾	3.55	36	4.65
October.....	28	3.20	32	4.50
November...	26⅜	3.20	29½	3.85
December...	24⅞	3.25	26¾	3.75
1896				
January.....	25½	3.35	28¼	4.45
February.....	27¾	3 60	29	4.35
March.....	28⅛	3.55	29¼	4.25
April.....	28¾	3.05	30⅝	4.15
May.....	27½	2.80	29½	3.75
June.....	26¼	2.70	28½	3.60
July.....	24¼	2.60	27¾	3.65
August.....	20½	2.50	25	3.70
September...	19½	2 45	22¼	3.50

[1] *Yearbook, U. S. Dept. of Agriculture,* 1899, pp. 799-800, 814.

PRICES OF PRODUCTS

Date	Indian Corn No. 2 Low	Hogs Low	Indian Corn No. 2 High	Hogs High
1896	Cents		Cents	
October.....	22¼	2.55	26½	3.65
November...	22¾	2.90	25½	3.70
December....	22½	2.90	23¾	3.60
1897				
January.....	21¾	3.00	23⅜	3.60
February.....	21¾	3.10	23¼	3.75
March.....	22¾	3.35	24½	4.25
April.....	23⅛	3.50	25¼	4.25
May.....	23	3.25	25½	4.05
June.....	23¼	3.05	25⅝	3.65
July.....	24⅝	3.05	28¼	4.00
August.....	26⅛	3.45	32⅝	4.55
September...	27¼	3.60	32	4.65
October.....	24	3.20	29	4.40
November...	25¾	3.15	27⅝	3.80
December....	25	3.10	27½	3.60
1898				
January.....	26	3.35	28¼	4.00
February.....	27½	3.60	30⅝	4.275
March.....	28⅛	3.65	29¾	4.175
April.....	28⅞	3.60	35¼	4.15
May.....	32⅜	3.70	27	4.80
June.....	31	3.55	33¾	4.50
July.....	31¾	3.60	35½	4.175
August.....	29¾	3.45	33¾	4.20
September...	29⅛	3.40	31⅜	4.15
October.....	28¾	3.25	32⅞	4.00
November...	31⅝	3.10	34½	3.85
December ...	33⅛	3.15	38	3.75
1899				
January.....	35¼	3.30	38⅛	4.05
February.....	33½	3.45	37	4.05
March.....	33	3.50	36⅛	4.00
April.....	34	3.50	35½	4.15
May.....	32½	3.45	34⅜	4.05
June.....	33¼	3.45	35½	4.00
July.....	31	3.55	34⅞	4.70

Date	Indian Corn No. 2 Low	Hogs Low	Indian Corn No. 2 High	Hogs High
1899	Cents		Cents	
August	30½	3.85	33	5.00
September...	31¼	3.90	35	4.90
October	31	3.80	33	4.90
November...	30¾	3.55	33¼	4.35
December....	30	3.55	31½	4.45
1900 [1]				
January.....	30½	3.70	31⅝	4.925
February.....	31½	3.70	34¼	5.10
March.....	33⅜	4.00	38¼	5.525
April.....	38¼	4.25	40⅞	5.85
May.....	36	4.00	40½	5.575
June.....	37⅜	4.10	43½	5.425
July	38⅜	4.25	44¾	5.55
August	37¼	3.60	41¼	5.575
September...	38⅞	3.50	43¼	5.70
October.....	36½	3.35	41¾	5.55
November...	35	3.40	49½	5.10
December ...	35¼	4.00	40½	5.45
1901				
January.....	36	4.25	37¾	5.475
February	37¼	5.10	40	5.65
March.....	39	4.90	44	6.20
April.....	41	4.40	48	6.25
May.....	42⅝	4.15	58½	5.975
June.....	41	4.25	44⅜	6.30
July	43½	3.00	58¼	6.35
August	53¾	3.00	59½	6.60
September...	54⅛	3.00	59¾	7.40
October	54⅝	4.25	58	7.10
November...	57⅛	3.75	63⅞	6.30
December ...	62½	4.00	67½	6.70
1902				
January.....	56½	4.40	64½	6.85
February.....	56⅝	4.40	61¼	6.85
March.....	56	4.75	61⅛	7.00

[1] *Yearbook, U. S. Department of Agriculture*, 1903, pp. 591-592, 674.

PRICES OF PRODUCTS

Date	Indian Corn No. 2 Low Cents	Hogs Low	Indian Corn No. 2 High Cents	Hogs High
1902				
April.....	56¾	5.40	64½	7.50
May.....	59⅛	5.40	64¾	7.50
June.....	61	5.65	71½	7.95
July	56	5.70	88	8.75
August	54	5.30	60	7.95
September...	57	5.50	62½	8.20
October.....	55	4.50	61½	7.90
November ...	52¾	4.60	58	6.95
December ...	43¾	4.60	57¼	6.85
1903				
January.....	43¾	5.00	48⅛	7.00
February.....	42½	5.30	45	7.55
March.....	41⅜	6.00	45⅝	7.85
April.....	41¾	6.30	45¼	7.65
May.....	44	5.10	46	7.15
June.....	47¼	5.25	52	6.35
July	49	4.60	53	6.20
August	50½	4.50	53	6.15
September...	45¼	4.85	52¾	6.45
October	43½	4.00	46	6.50
November ...	41⅜	3.75	44¾	5.50
December....	41	3.80	43¾	4.90
1904 [1]				
January.....	42¾	3.85	47½	5.20
February.....	46	3.90	54½	5.80
March	49	4.00	56½	5.825
April.....	46½	3.75	56⅞	5.30
May.....	47¼	3.70	50	4.95
June.....	53¼	4.00	59½	5.475
July.	47¼	4.70	50	5.90
August	51¼	4.60	55¾	5.80
September...	51	4.70	54¾	6.375
October	50	4.40	57¼	6.275
November ...	50	3.65	58⅛	5.25
December ...	43½	3.60	49	4.875
1905				
January.....	42	3.90	43¼	5.00
February.....	42¾	4.10	45½	5.15

[1] *Crop Reporter, U. S. Dept. Agri.*, March, 1905, p. 95.

CHAPTER IX

THE DISTRIBUTION OF WEALTH, WITH ESPECIAL REFERENCE TO THE RENT OF FARM LAND AND TO THE CONDITIONS WHICH ENABLE FARMERS TO SAVE FROM THEIR EARNINGS.

Having sold his products upon the local market, what determines the share of the gross receipts which the farmer may keep as payment for his labor and enterprise, and what determines the proportion which must be paid for the use of land and capital-goods? Farmers of varying degrees of efficiency employ capital-goods of varying degrees of usefulness upon land of varying degrees of productivity. With these three variables united in varying proportions in the production of articles which vary in their market value from place to place and from time to time, the problem before us is to determine the share of the gross returns which each factor will receive.

This is by no means a simple problem. There is a very complex set of forces and conditions which make it necessary for a given farmer at a given time and place, to credit a certain proportion of his gross returns to capital-goods, and another certain share to land; but at another time on the same farm or on another farm at the same

time, or with a different farmer on the same farm at the same time, the share of the gross returns received by each factor may be different. The problem of distribution is consequently so complex and difficult that it will be impossible in this work to do more than to indicate in a general way the operation of the forces and conditions which regulate the distribution of the product among the factors of production.

Let us first examine the different factors of production,— land, capital-goods, and farmers,—and determine if possible how much each factor must receive in order that it may be induced to participate in agricultural production. In this discussion we shall speak of farmers, as synonymous with labor, for the reason that this will simplify the discussion, and for the further reason that in the vast majority of cases most of the farm work is done by the farmer and his family.

The farmer must receive, at least, enough to sustain his body in a working condition, and he will usually demand more than this. He will usually want to support a family, and this is essential to the future supply of labor. It may be said, therefore, that in the long run, the least return that will induce men to become farmers is maintenance for themselves and their families in accordance with the "standard of life,"[1] which

[1] "The number and character of the wants which a man considers more important than marriage and family consti-

seems to them essential to happiness. It is true that many farmers always receive as their share of the product, more than this necessary minimum. This is generally true of the more efficient farmers; but the marginal farmers may be thought of as receiving this minimum when long time averages are taken into account.

There will always be fluctuations; there will be times when the demand for farmers is great relatively to the supply, and as a result even the marginal farmers will receive more than the necessary minimum which is required to induce them to participate in agricultural production. This condition of affairs would make agriculture a very attractive pursuit, however, and the tendency would be for men from other pursuits to be attracted into agriculture; or at least for a smaller proportion of each generation of farm boys to enter the industries of the cities, and in the course of time the competition would drive the profits of the marginal farmer down to the minimum.

Again, the number of competing farmers may become too great, so that the returns of the marginal farmers will be depressed far below the necessary minimum; but this would result in the elimination of some of the less efficient farmers, and perhaps others as well, who would decide they could do better in some other industry. To the

tutes his 'standard of life'." (R. T. Ely, *Outlines of Economics*, p. 181.)

extent that these marginal farmers are eliminated, a higher grade of farmers will be found upon the margin. These new marginal farmers will be able to make a living for themselves and their families and give a larger share of the gross returns to the other factors than could the less efficient competitors who have been crowded out. The elimination of some of the farmers would also relieve to some extent the pressure of competition. As a result of the lifting of the margin to more efficient farmers and of this lessened competition the returns to the marginal farmers will tend to be adjusted to the minimum which the standard of life of these marginal farmers makes necessary to induce them to participate in agricultural production.

The share of the product which the more efficient farmers are able to command will be taken up later, since for the sake of simplicity, it has been thought best to continue first the discussion of the conditions and forces which regulate the distribution of their gross product among the grades of the factors which are brought together on the margin,—that is among the least efficient farmers, and the least productive land in use and the least productive grades of capital-goods.

On the margin where the least productive of all of the factors of production are brought together, there is no chance for a differential return to be commanded by any of the factors. There is no

return to land except enough to pay for bringing it into cultivation, and this should perhaps be counted as return to the capital-goods employed in bringing the land under cultivation, in which case the whole product could be said to be divided between the farmers and the capital-goods. With this in mind it might seem the simplest explanation of the return to marginal capital-goods, to say that all of the return except the necessary minimum demanded by the farmers must be credited to capital-goods. This may tend to be true, and yet it explains nothing. It leaves unanswered the question why it is that less productive land is not cultivated at a given time, for the farmers might receive their necessary minimum from such land, although this would result in a reduction in the return which could be credited to capital-goods. It becomes evident therefore that the return to capital-goods is regulated by a set of more or less independent forces.

It is well understood that capital-goods must be kept intact, that seed grains must be replaced, that when a machine is broken it must be put in repair, and when it is worn out it must be replaced, and that the horses must be fed and cared for; but beyond this amount which is necessary for maintenance, a certain amount must be paid for the use of capital-goods. This return is usually expressed in terms of an annual rate per cent. upon the value of the capital-goods, but there is no good

reason why it should not be thought of as the hire paid for the use of the capital-goods.

The marginal farmer and the marginal capital-goods must, on the long time average, be maintained, and the hire of the capital-goods must be paid. As land which will not produce this much will not be brought under cultivation, it is clearly the return demanded by farmers for labor and the use of capital-goods which determines the margin of cultivation, and not the productivity of the marginal land which determines the amount which is paid for the use of capital-goods. But why is it that more must be paid for the use of capital-goods than sufficient to keep such goods intact? In other words, why must a hire be paid for the use of capital-goods?

First, the supply is limited. The supply cannot be increased indefinitely without some sacrifice of the gratification of present desires. Men are usually desirous of laying up something for the future, but they are more concerned with the gratification of present wants until the latter are partially satisfied. That is, men value the means of gratifying their present wants more highly than they do the means of gratifying the wants of of the future, and as a result, after saving has reached a certain point, they will not refrain from consuming wealth to-day in order that it may be turned into capital-goods, unless they have the assurance that a greater amount of wealth will be

returned to them in the future. In old countries where there is much wealth already accumulated in the various forms of capital-goods, the present wants, of the wealthier classes at least, are more completely satisfied, and future wants are estimated relatively more highly than in a poor country where present wants are more intense. Hence the amount of hire which must be paid for the use of capital-goods will be smaller in wealthy countries than in countries where little wealth has been accumulated.

While the fact that the supply of capital-goods cannot be increased without labor and the fact that present goods are valued more highly than future goods explain why something must be paid for the use of capital-goods, these circumstances do not account for the fact that men are willing to pay a price for the use of capital-goods. Men are willing to pay a hire for the use of capital-goods because these goods aid in production. The farmer can stir more ground or reap more grain in a day, he can produce more goods for the market in a year, when he uses plows, reapers, horses, etc., than when he labors unaided by these.

These then are the forces and conditions which lie behind the supply of and the demand for capital-goods, and which regulate the amount of hire which is paid for their use. The greater the opportunities for gaining a profit by employing them, the greater will be the demand for capital-

goods and the higher the price which will be offered to induce men to sacrifice present for future goods. This explains in part the high price which is paid for the use of capital-goods. On the other hand, the higher the price the fewer will be the opportunities for investing capital-goods with profit, and thus the demand is limited in part by the conditions of supply.

We have now reviewed the conditions and forces which seem to determine the distribution of the gross returns of the marginal farmers operating marginal capital-goods upon marginal land, but to complete the theory of distribution it is necessary to explain the conditions and forces which determine the distribution of the gross returns of the more productive grades of the factors of production. The more efficient farmer is able to command more than the minimum which is necessary to the marginal farmer; this is likewise true of the more productive grades of capital-goods, and all the more productive grades of land afford a return to the owners.

The share of the gross return which is attributed to land varies from place to place because of variations in the productivity of land. Other things remaining the same, the more fertile the soil and the higher the local market prices which can be obtained for the products of the farm, or—to state the same thing in other words—the more productive the land, the keener will be the compe-

tition for its use and the higher will be the rent which the farmers will offer for it. In a progressive society the least productive land which is required for supplying the market at a given time will command rent enough to pay for bringing it under cultivation; but this rent is, in reality, paid for the use of capital-goods. Such land is called marginal land. It has often been called no-rent land, because no differential rent is paid for its use, and the differential rent is the only distinctively land rent. All land which is more productive than the marginal, will have a rent paid for its use. Because it is more desirable, the farmers will compete for the more productive land until the rent rises to a point where they find it equally desirable to take the less productive land at a lower rent.

If land were the only factor which varies in productivity, it would be a very easy matter to state the law of rent; for then all of the farmers and all of the capital-goods would tend to receive the minimum, which is just enough to enlist in the industry the least productive grades of these factors. Under these conditions the total return minus the necessary minimum to labor and capital-goods would be credited to land.

This may be illustrated by means of a diagram. In Figure 4, the line *A B* represents the various grades of land arranged in accordance with their degrees of productivity, the most productive being

at *A* and the least productive land in use, or marginal land, at *B*. The value of the product is represented by the perpendicular distance from line *A B* to line *C D'*. That share of the value of the

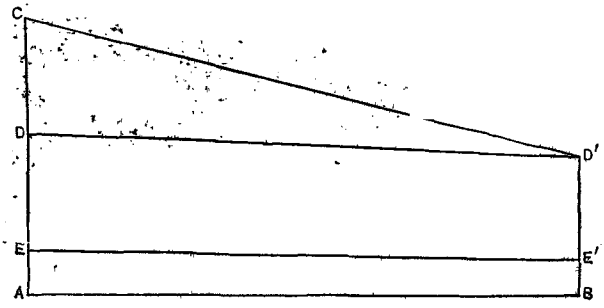

FIG. 4

product represented by the perpendicular distance between lines *A B* and *E E'* may be looked upon as the necessary minimum required to enlist the capital-goods, and that share represented by the perpendicular distance between *E E'* and *D D'* may be looked upon as the necessary return to the farmers. The remainder, measured by the perpendicular distance between lines *D D'* and *C D'*, varying from nothing on the margin to a very large share of the gross returns on the most productive land, would then represent the differential rent of the land.

Attention should be called to the fact that in the illustration (Fig. 4) the lines *E E'* and *D D'* are not parallel to line *A B*, that a larger amount

per acre of land is represented as being attributed to the farmers and to the capital-goods on the more productive than on the less productive grades. This is intended to indicate that even under the conditions of homogeneous farmers and homeogeneous capital-goods the more productive grades of land would be farmed more intensively, and hence a larger amount per unit of land would be credited to these factors.

The fact that these more productive grades of land are cultivated more intensively and that a larger amount is for this reason credited to the other factors from each acre of land, does not lessen the amount of rent, but rather increases the amount which can be paid for the use of the more productive land. That the more productive grades of land can, with profit, be cultivated more intensively than the less productive grades and that this gives rise to a greater differential rent being paid for the use of the more productive land than the difference between the value of the product of such land and marginal land under equally intensive culture, was recognized and elucidated by Ricardo.

To illustrate the influence of variations in the intensity of culture upon the amount of differential rent which will be paid for the better grades of land when less productive land must be resorted to in order to supply the demand for agricultural products, suppose that a farmer has three grades

of land to choose from. These three grades of land are represented by letters *A, B,* and *C* (Fig. 5), the latter being marginal land. The curves

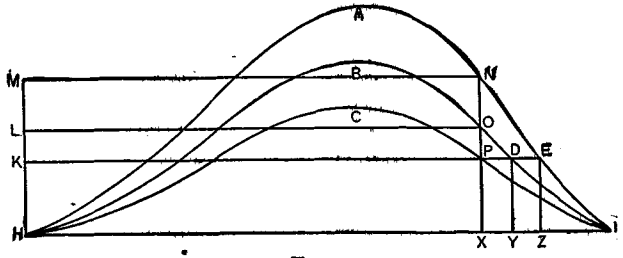

FIG 5

H A I, H B I, and *H C I* represent the increasing and diminishing returns to succeeding units of labor and capital-goods upon the different grades of land. We have made this somewhat more simple than the actual conditions by taking a case where the lines of increasing and diminishing returns have a definite relation to each other. The largest gross return per unit of labor and capital-goods will be gained from each of these three pieces of land when *X* units (measured by line *H X,* in Fig. 5) have been expended. With this expenditure upon each of the three grades of land, the value of the product which a given farmer can produce on *A* grade land will be represented by the area *H M N X;* that of *B* grade land, by the area *H L O X;* and that of *C* grade land, by the area *H K P X.* But, the same amount of labor and capital-goods will not be applied to the three

grades of land. It will prove profitable to farm the more productive land more intensively before it will prove profitable to farm the less productive land at all. When it is profitable for a farmer to apply *X* units to *C* grade land it will prove equally profitable for him to apply *Y* units to *B* grade land and *Z* units to *A* grade land.

We are now in a position to see more clearly the influence of varying degrees of intensity of culture upon differential rents. In the illustration the surplus which a given farmer can produce on *A* grade land (Fig. 5), over what he can produce on *C* grade land is represented by the area *K M N E,* which is greater than the area *K M N P* by the area *P N E;* but the area *K M N P* measures the difference in the value of the product which he could produce on the two pieces of land with the same outlay. The surplus which the same farmer can produce upon *B* grade land, over what he can produce upon *C* grade land is represented by the area *K L O D;* that of *A* grade land over *B* grade by area *L M N E D O.* Hence, it is not simply differences in productivity with the same outlay, but it is the differences in the capacity of the land to yield a surplus, that determines how much more highly a farmer will estimate one piece of land than another of the same area.

The theory of rent would be quite simple if it could be said that the differential rent of land is

measured by the amount of surplus over costs which can be produced upon a given grade of land. But this is not true. The farmers who are qualitatively more efficient find greater opportunity for the employment of their superior skill and knowledge upon the more productive, than upon the less productive land. The farmers who possess a relatively high degree of qualitative efficiency can win a larger return from land of any grade than can their less efficient competitors, but this extra product due to superior ability is greater on the more productive than on the less productive land and for this reason the more efficient farmers compete only for the more productive land, and are willing to pay more for it than the less efficient farmers can afford to pay. The qualitatively less efficient farmers go on competing for the less productive land until marginal farmers are shifted to marginal land. Hence, the difference between the rent of marginal land and that of the more productive land cannot be measured in terms of differences in the amount of the surplus which would exist if land were the only factor which varies in productivity.

This can be illustrated by means of a diagram. In Fig. 6 the land is represented as varying in productivity from left to right, the most productive land being at the left, and called *A* grade land; the least productive being at the right and called *B* grade land. (For the sake of simplicity,

it will be assumed in this illustration, that the same degree of intensity of culture exists throughout the area under consideration.) The perpendicular distances represent the value of the product. The distance $A\,C$ represents the value of the product which the most efficient farmer can produce upon the most productive land, the distance $B\,C'$ represents the value of the product which the same farmer could produce upon marginal land. The distance $A\,D$ represents the value of the product which the marginal farmer could produce upon the most productive land, the distance $B\,D'$ represents the value of the product which the marginal farmer can produce upon marginal land. (To facilitate the discussion, we shall call the former the C grade farmer and the latter the D grade farmer.)

Let it be supposed that the land which is necessary to supply the demand for a certain class of agricultural products, such, for example, as the diversified agriculture of the corn belt, varies in productivity from A to B, that A grade land is twice as productive as B grade land, and that all other land under consideration is more productive than B and less productive than A grade land. Let it be supposed, also, that all of the farmers who are able to compete for the use of this land at a given time vary in qualitative efficiency from C to D (as represented in Fig. 6), that the farmer who has C degrees of efficiency is qualitatively

twice as efficient as the one who possesses *D* degrees of efficiency, and that the other farmers are graded according to their efficiency from *C* to

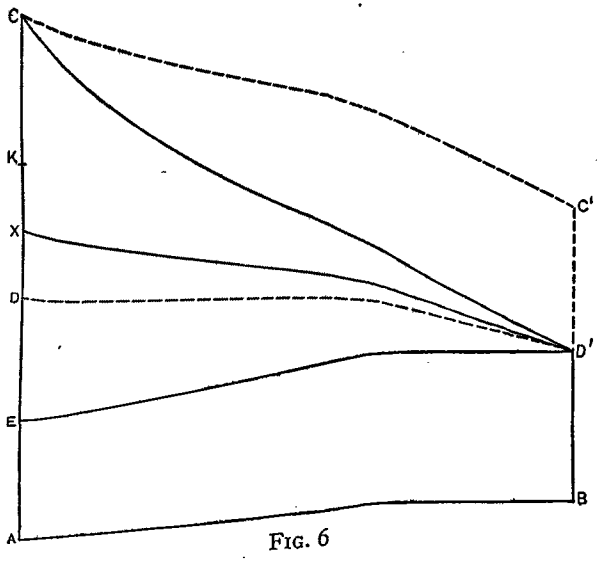

FIG. 6

D, as the land is graded from *A* to *B*. The farmer who possesses *C* degrees of efficiency can produce twice as much on land of any grade as can the farmer with *D* degrees of efficiency. The *D* grade farmer is the marginal farmer, and must receive enough on marginal land to cover costs, including a living. On the *A* grade land, which is twice as productive as the marginal land, he can produce twice as much with the same outlay, and

is willing to pay a differential rent for it equal to one-half of the product.

Let it be said that the *D* grade or marginal farmer's product on *B* grade land is valued at *n* (represented by the line *B D'* in Fig. 6), that his product upon *A* grade land is valued at *2n* (represented by the line *A D*), and that he is willing to pay a differential rent of *n* (line *E D*), for the use of *A* grade land. Then the value of the product of the *C* grade farmer, who is qualitatively twice as efficient as the marginal farmer, will be *2n* (line *B C'*) on *B* grade land, and *4n* (line *A C*) on *A* grade land. Thus, while the *C* grade farmer can gain an extra product valued at *n* (line *D' C'*) on *B* grade land, his extra product on *A* grade land, above what the *D* grade farmer could produce, is valued at *2n* (line *D C*). Hence the *C* grade farmer will not compete for *B* grade land until the rent on *A* grade land rises sufficiently to absorb half of this extra product, so that his net profit will be the same on both pieces of land. Until rent rises to *2n* on *A* grade land (that is, to point *K* in Fig. 6, and measured by the line *E K*), the personal profit which the *C* grade farmer can win on such land will be greater than that which he could win from *B* grade land. If the differential rent of *A* grade land should rise to *2n* (that is, to point *K*), the *C* grade farmer's personal profits on *A* grade land (represented by line *K C*), would be the same as that which he could win

on *B* grade land (represented by line *D' C'*), being valued at *n* in either case. But, while the *C* grade farmer will pay a rent of *2n* for *A* grade land rather than farm marginal land, the *D* grade farmer will take marginal land rather than pay more than *n* for *A* grade land. With the given hypothesis the differential rent of *A* grade land will not be less than *n* (measured by line *E D*), for the *D* grade farmer can afford to pay that much for its use; and it will not rise higher than *2n* (measured by the line *E K*), for the *C* grade farmer would then prefer marginal land for which no differential rent is charged.

With all grades of farmers competing for the use of land, the differential rent of *A* grade land will be greater than *n*; for, at rent of *n*, all but the marginal farmers will prefer it to inferior land, because the extra product, due to superior qualitative efficiency, is greater on the more productive land. To the extent that the better farmers follow their highest economic self-interest they will compete for the better land, and the rent of such land will rise, until, one by one, the less efficient farmers find it preferable to take less productive land at a lower rent. The farmers who are qualitatively most efficient can pay more for the best land than any of his competitors can afford to pay and still receive a larger net profit than he would receive from the less productive land at the rents which the less efficient farmers pay for such land.

When each farmer has taken the land for which his degree of efficiency enables him to compete to the best advantage, the marginal farmer will be found upon the marginal land, the average farmer upon the average land, and the most efficient farmer upon the most productive land. The product resulting from this most economical application of efficiency to productivity will be measured by the area $A\ C\ D'\ B$ (Fig. 6). It will be noticed that the line $C\ D'$ is not a straight line. This is not a straight line because its distance from the line $A\ B$ is determined by multiplying productivity by efficiency, both of which are decreasing factors as we go from the most productive to the marginal land. With regular and close gradation of land and of farmers this line would tend to be a regular curve. This curve will probably be irregular, however; for the continuous and regular gradation of land and of farmers which would be necessary to produce a regular curve, gradually falling from C to D', could, perhaps, never be found.

The line $X\ D'$, which may be called the rent curve to distinguish it from the product curve $C\ D'$, is drawn arbitrarily to illustrate the way in which rent will rise above the line $D\ D'$, which line represents the level to which the rent could rise on the various grades of land if all farmers possessed the same degree of qualitative efficiency as the marginal farmers. Point X will be some

place between D and K, because, as has been shown, the differential rent of A grade land can neither be less than n nor more than $2n$. Thus the area $E\,D\,D'$ (Fig. 6) represents the differential rent under the assumption that all farmers have the same degree of qualitative efficiency as the marginal farmers, and the area $D\,X\,D'$ represents the further differential which arises from variations in the efficiency of the farmers. These two constitute the differential rent which would be paid under the conditions assumed; namely, with homogeneous capital-goods, equally intensive culture on all land, and perfect competition.

The remainder of the surplus represented by area $X\,C\,D'$ would go to the farmers as personal profits, the amount of personal profit received by a given farmer depending upon his relative degree of qualitative efficiency.

Another method of illustrating the distribution of the proceeds among the factors of production is as follows: Suppose six grades of farmers, represented by letters A, B, C, D, E, and F are in competition for as many grades of land designated as 1st, 2d, 3d, 4th, 5th, and 6th grade land. Let us assume that on any grade of land the A grade farmer can secure a gross return twice as great, with a given outlay, as the F grade farmer can secure, and that the gradations in the qualitative efficiency of the farmers is continuous and regular from the A grade to the F grade farmer. Let it

further be assumed that any of these farmers can secure twice as large a return on the 1st grade land from a given outlay as he can secure on 6th grade land, and that the gradation of the land is continuous and regular from the first to the sixth grade.

With these assumptions in mind let the following figures represent the value of the gross product which the farmers of the respective grades can produce as a result of the employment of a given quantity of labor and capital-goods on the different grades of land. To make this illustration include the factor of variations in intensity of culture we have taken a fixed amount of expenditure instead of a fixed area of land. If, therefore, one acre be the area of the 6th grade land on which this fixed amount of expenditure is made, less than an acre of the more productive grades of land will be associated with the given amount of labor and capital-goods, for the more productive the land the more intensive the culture.

	Grades of Land					
Grades of Farmers.	1st.	2nd.	3rd.	4th.	5th.	6th.
A	20	18	16	14	12	10
B	18	16.2	14.4	12.6	10.8	9
C	16	14.4	12.8	11.2	9.6	8
D	14	12.6	11.2	9.8	8.4	7
E	12	10.8	9.6	8.4	7.2	6
F	10	9	8	7	6	5
Competitive rent	7.25	5.40	3.75	2.30	1.5	0

It is fair to assume that the *F* grade or mar-

ginal farmer when operating 6th grade or marginal land will just be able to make a living without paying any rent for the use of the land. But if the *F* grade farmer can make a living on 6th grade land when he has no rent to pay, he can make a living and something more on the 5th grade land, and, if we think of the figures in the illustration as representing dollars, the *F* grade farmer can afford to pay just one dollar as rent for the quantity of 5th grade land on which he would make the same outlay as on an acre of the 6th grade land, for instead of a product worth five dollars he secures a product worth six dollars. Following the same reasoning the *F* grade farmer could afford to pay two dollars for the 4th grade land, three dollars for the 3d grade, four for the 2d, and five dollars for the quantity of 1st grade land on which he would employ the given amount of labor and capital-goods in farming that land to the most economical degree of intensity.

When all of the grades of land are viewed from the standpoint of the *A* grade farmer, it becomes apparent that he would be able to make more than a living on land of any of these grades, and that he would do as well to pay a rent of two dollars for the use of 5th grade land, four dollars for 4th grade land, six for the 3d, eight for the 2d, and ten for the 1st grade land, as to farm the 6th grade land rent free; and in our illustration we shall assume that the *F* grade farmer is needed to sup-

ply the demand for farmers when the six grades of land are in use, and as he cannot pay any rent for its use it is fair to assume that no other farmer will pay anything for its use. All of the farmers who possess a higher degree of qualitative efficiency than the *F* grade farmer are in a position to pay more for the more productive grades of land than the *F* grade farmer can possibly pay, and still secure a larger net return on their investments than they can make on marginal or *F* grade land when the latter is rent-free. It becomes evident, therefore, that the *F* grade farmer will, under keen competition, be confined to the 6th grade land and that in a competition for the other grades of land he is not able to bid high enough to make it desirable for any of the more efficient farmers to prefer the 6th grade land.

But the question before us is, how much rent will the competition among the farmers of the various grades of farmers induce them to pay for the various grades of land? Under the hypothesis that the *F* grade farmer and the 6th grade land are both needed to supply the demand at a given time and with a given price level, competition will leave a minimum return of five dollars to the *F* grade farmer when he confines his attention to the 6th grade land and no rent will be paid for the 6th grade land. The *E* grade farmer is able to secure a return of six dollars on the marginal land. It cannot be expected, therefore, that

he will be willing to take less on any other grade. He can pay one dollar and twenty cents for the amount of 5th grade land on which the same outlay is made as on the acre of the *F* grade land, and retain a net return equal the gross return on the no-rent land. But the *F* grade farmer can bid no more than one dollar for the use of this land, and so far as he is concerned, the *E* grade farmer can have the 5th grade land for anything over one dollar, and to give a small balance let us say he will offer one dollar and five cents.

If the *E* grade farmer can secure the use of 5th grade land for one dolar and five cents per unit (thinking of the amount of land on which the given amount of labor and capital is expended on the various grades of land as a unit of land power) leaving him a net return of six dollars and fifteen cents, he will certainly not take less on 4th grade land. He will cease to bid for the 4th grade land, therefore, when the rent rises above two dollars and twenty-five cents. When the rent of 5th grade land is one dollar and five cents the *D* grade farmer could secure a net return of seven dollars and thirty-five cents on that grade of land, and he could as well pay two dollars and forty-five cents for 4th grade land, for this would leave him the same net return as he could win on 5th grade land, but so far as the competition of his inferiors is concerned any amount over two dollars and twenty-five cents, let us say two dollars and thirty

cents is all he need pay, and this will leave him a net return of seven dollars and fifty cents which is fifteen cents better than he could do on the 5th grade land. To secure the same net return on 3d grade land, the *D* grade farmer cannot bid over three dollars and seventy cents for its use. But the *C* grade farmer whose net return on 4th grade land, at a rent of two dollars and thirty cents, would be eight dollars and ninety cents, can secure the same net return from 3d grade land after paying three dollars and ninety cents rent for its use, so that it will be profitable for him to outbid the *D* grade farmer for 3d grade land by offering three dollars and seventy-five cents. This leaves the *C* grade farmer a net return of nine dollars and five cents, and to secure the same net return from 2d grade land he can pay no more than five dollars and thirty-five cents as rent for 2d grade land. But the *B* grade farmer can as well afford to pay five dollars and fifty-five cents for 2d grade as to pay three dollars and seventy-five cents for 3d grade, and we may assume, therefore, that he will outbid the *C* grade farmer by offering five dollars and forty cents for the use of the 2d grade land. This would leave the *B* grade a net return of ten dollars and eighty cents. He could pay seven dollars and twenty cents for 1st grade land, and secure the same net return; but the *A* grade farmer could pay anything, less than seven dollars and forty cents, rather than use any

of the less productive grades of land at the rents which any of the other grades of farmers could afford to pay for those grades of land. It may be assumed, therefore, that he would pay seven dollars and twenty-five cents for the 1st grade land.

With the competitive rents determined in this way the *A* grade farmer can secure a larger net return, and therefore a larger net profit, on 1st grade land than on land of any other grade. This is true also of the *B* grade farmer on the 2d grade land, and so it continues to be true for the succeeding grades of farmers on the corresponding grades of land. The *A* grade farmer's net return would be twelve dollars and seventy-five cents, but from this must be deducted the necessary return to capital-goods. The remainder, in case all the labor is performed by him and his family, is the net profit. Now since the capital is usually owned by the farmer, it is the net return minus the maintenance of the capital-goods and the farmer's cost of living, which shows the capacity of the farmer to save from his earnings.

These figures are intended only as an illustration, but as an illustration they may enable the student to comprehend the complex character of the forces which are operating to determine the amount of rent which must be paid for a given piece of land at a given time, also how it is that some farmers can pay high rents and at the same

time make large profits; and, finally, it is hoped that by this time it has become quite clear that it is to the interest of each farmer to select that grade of land which corresponds to his degree of qualitative efficiency.

In this illustration we have considered competition in but one kind of agriculture. The more efficient farmer in one branch of agriculture may be the less efficient in another. The best shepherd may be a poor market gardener and *vice versa*. The shepherd will be able to win his largest net profit on cheap land, while the market gardener can do best on expensive lands near the great cities. Yet the general principle holds that the best shepherd can win the largest net profit on the best sheep land, and the best market gardener on the land best suited to his particular line of production.

There is also a differential paid for the use of the more productive forms of capital-goods. This is usually hidden behind the fact that the return to capital-goods is usually thought of in terms of a rate per cent. upon the capital value of the capital-goods. It might be satisfactory to think of the returns to capital goods in this way were it true that the valuations of the different grades of capital-goods varied exactly as the productivity of these capital-goods; but, because of the variations in the qualitative efficiency of the farmers, the variations in the values of these goods

do not correspond to the variations in their productivity. In just the same way as in the case of land, the qualitatively more efficient farmers are in a position to pay more for the more productive grades of capital-goods than the qualitatively inefficient can afford to pay; and the value of the capital-goods, as is the case in the value of land, tends to vary with the amount which is paid for its use.

This may be illustrated by Fig. 6, by simply replacing the term land by the term capital-goods. In fact it seems clear that, in considering the situation at a given time, land and capital-goods might well be considered together in the illustration given in Fig. 6 when it is the farmer's surplus due to superior efficiency that is under consideration. It seems that the land and capital-goods employed in agricultural production, are alike in that a differential is paid for the better grades, and that the qualitatively more efficient farmers can well afford to pay more for the use of these better grades of the material instruments of production than the qualitatively less efficient farmers. Indeed, it would seem that this principle may be applied quite generally, and that it explains why the more efficient men in all lines of economic activity are able to outbid the less efficient for the better facilities for production.

With perfect competition the differential rent of any grade of land or of any grade of capital-

goods will be measured by the differential surplus which the marginal farmer could produce upon such land, by employing such capital-goods, plus the further differentials arising from differences in the efficiency of the farmers.

Variation in productivity is, to be sure, the primary occasion of differential rents, and if all farmers possessed the same degree of qualitative efficiency, the differential surplus would represent the differential rent, being the additional amount which all farmers would as willingly pay for the better land and the better grades of capital-goods as consent to using the less productive grades of these material agents of production. But because of the differences in the efficiency of farmers, the amount of differential surplus which a given piece of land or a given horse or machine will yield is not a definite amount, but varies with the qualitative efficiency of the farmers; and competition determines what share of the surplus, which a given farmer can produce, will actually be paid as differential rent. The differential rent of the better grades of the material instruments of production will be greater than the differential surplus which the marginal farmer could produce by using them, but it will be less than the surplus which the most efficient farmer can produce.

Fig. 7 is intended to illustrate the distribution of the gross returns of the agricultural industry,

among the factors of production. This illustration is a modification of Fig. 6, and it is assumed that the factors will be brought together in the most productive manner, that is, with the qualitatively most efficient farmers operating the most productive forms of capital-goods upon the most productive land and that these factors are associated in the proper proportion. Under these conditions the composite units which are made up of the most productive grades of the factors, will yield a relatively larger product, in proportion to their productivity even, than the units made up of the less productive grades of the factors, and hence, in the higher grades each factor will receive the necessary minimum and a further differential due to superior productivity and to the coöperation of the more productive grades of the factors.

When the subject of distribution is viewed from the standpoint of industrial progress, through a long period of years, the most important fact to be considered is that the other factors usually increase more rapidly than does land. As the farmers and the capital-goods continue to increase more rapidly than the land, some of the better grades of these more rapidly increasing factors are crowded down farther and farther upon the less and less productive land. This necessarily results in the driving out of business of some of the lower grades of the farmers and the capital-goods, leaving upon the margin higher

grades of these factors which will be able to earn their necessary minimum upon lower grades of land, and hence the margin of cultivation will be

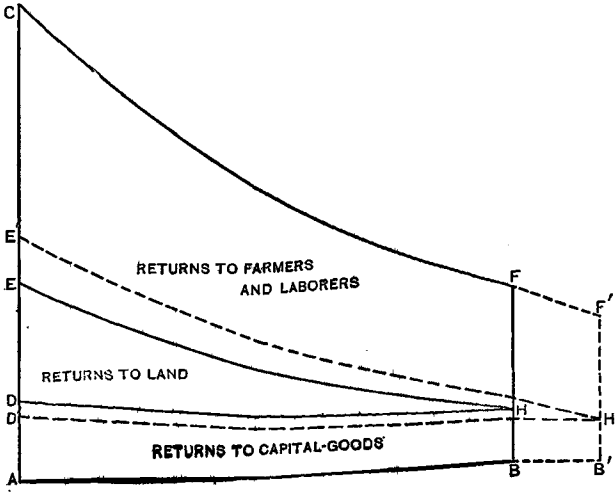

FIG. 7

driven down to less productive land by the competition of the increasing numbers of farmers and the increasing quantities of capital-goods. The resulting change in the distribution of the gross product among the factors, is illustrated by the dotted line in Fig. 7, where it will be noted that the rent rises as a result of a fall in the returns to the other factors of production.

It is possible for the rent to rise, however, without any absolute decline in the returns to the other factors. Changes in the prices of agricul-

tural products will greatly influence the share which will be accounted to land. When, as a result of increased demand for food and clothing, the prices of agricultural products rise, the share of the returns of a given farm which may be credited to land, increases. When, for any reason, such as the opening up of vast areas of very productive land, the prices of agricultural products fall, the share of the gross returns which can be paid for the use of land will, other things remaining the same, necessarily fall.

The laws of value and price hold true with respect to the price which is paid for the use of land and capital-goods; but as we have seen, the conditions as to supply and demand are very complex, and the difficult problems in distribution arise out of the fact that costs and prices do not correspond except on the margin where the least productive of all of the factors are brought together, and that there are large surpluses over costs, to be divided. It was one time thought that all of this surplus should be attributed to land; but in recent years economists have come to see that each of the factors is in a position to command a share of the surplus, that the share secured by each is worked out through supply and demand, and that the most slowly increasing factor tends to receive a larger and larger proportion of the surplus.

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CHAPTER X

THE PRINCIPLES TO BE FOLLOWED IN ESTIMATING THE VALUE OF FARM LAND AND EQUIPMENTS.

It is easy to say that the price of land, like the price of any other economic goods, is determined by the forces and conditions which regulate the demand and the supply; but this is too general to be of any help to the farmer who is trying to estimate the value of a particular piece of land.

The net rent, or the share of the gross returns which, under conditions of free competition, is credited to land, above what is necessary to keep the land intact, is the starting point for figuring the value of a piece of land. When one invests in land, the thing for which he really pays is the perpetual right to use the land and to be free from the payment of rent, or to receive the income which the land will yield if leased to someone else.

The essential difference between the buying of a piece of land and the buying of a perpetual annuity bond lies in the fact that while the income from the latter is fixed in terms of a money income, the former may rise or fall as a result of changes in the conditions of competition for the

use of land, or from changes in the value of the unit of the standard of value.

Let it be assumed that the net rent of a given piece of land is three dollars. On the further assumption that this amount will not change, we may think of this acre of land as a perpetual bearer of an annual income of three dollars. Three dollars this year, three dollars next year, and the next, and so on so long as time shall last. The total amount of rent which may be received from this land is incalculable. If there is no limit to the number of years during which rent may be received for the use of this land, then the amount of rent to be received may become infinitely great, and if one were required to pay down the full amount of all these possible rents, which the future years may possibly yield, the price of land would be such that no man could purchase it.

As a matter of fact, however, the present market value of the perpetual rent bearer is often not more than twenty times the net rent, and it is seldom more than thirty times the rent. This is explained by the fact that present wants are estimated more highly than future wants, which leads to the discounting of future incomes[1] "at a rate that reflects the prevailing premium on the present." The rent which will be due one year from

[1] Frank A. Fetter, *Publications of the Am. Econ. Assn.*, Papers and Proceedings of the Sixteenth Annual Meeting, Part I., p. 196.

date is discounted at this prevailing rate, and so it is for all the succeeding rents. The present values of the succeeding future rents grow smaller and smaller as the time one must wait for them becomes greater and greater, until finally the rent which is due at the end of an infinite period of time would be infinitely small.

When the rate of discount is five per cent., for example, the present valuation of a three dollar rent which will be due in ten years is approximately one dollar and eighty-four cents; the three dollar rent which is due after twenty years has a present valuation of about one dollar and twelve cents; and the three dollar rent which is due in forty years has a present value of about forty-two cents. If this process of discounting future rents be carried far enough the point would finally be reached where the present value of the future rent is too small to be taken into account. The present value of the rent which is due after an infinite number of years is infinitely small. If the present values of all these future rents be added together the sum would be the present capital value of the land, or the amount of capital which, if lent at a rate of five per cent. per annum would yield the same income as the land is yielding at the present time.

The simple mathematical method of finding this "sum" is to divide the annual value, that is the net rent, by the rate which "reflects the pre-

vailing premium on the present." If the net annual income derived from a piece of land is three dollars per acre and the rate of discount is five per cent., the present capital value of the land would be sixty dollars per acre. Sixty dollars, is, then, the amount of money which, if lent at five per cent. would yield an annual income of three dollars. This is usually spoken of as the *capital value* of the land.

That this simple method of dividing the three dollar net rent by the prevailing rate of discount to find the capital value of a piece of land is equivalent to finding the sum of an infinite series of prospective net annual three dollar rents discounted at the same rate may be demonstrated as follows:

The present value of a dollars due in t years if the interest be compounded annually at the rate of r would be $\frac{a}{(1+r)^t}$ since X dollars compounded at rate r would give $X(1+r)^t$, and if $X(1+r)^t = a$ then $X = \frac{a}{(1+r)^t}$. If then the net income of a farm be a dollars a year its value would be expressed by the equation: $V = \frac{a}{1+r} + \frac{a}{(1+r)^2} + \frac{a}{(1+r)^3} + \frac{a}{(1+r)^4} + ad\ inf.$ This is an infinite "geometrical" progression with first term $\frac{a}{1+r}$ and

ratio $\frac{1}{1+r}$. The limit of the sum of such a series is $\frac{\frac{a}{1+r}}{1-\frac{1}{1+r}}$ which reduces to $\frac{a}{r}$. We have then the formula for the value: $V = \frac{a}{r}$ which is the ordinary method of capitalizing rent.[1]

As a matter of fact, however, the present capital value of the land as determined in this way does not often correspond with the price which is paid for land. There are several important reasons for this difference. First it is not certain that the annual income that can be drawn from sixty dollars will always be three dollars. The rate of interest may fall to four per cent. which would reduce the income to be derived from that amount of money to two dollars and forty cents, while the annual income from the land would not be reduced by a lowering of the current rate of interest. The belief that there is a greater probability of a decline in the income to be derived from the money than from the land, often makes men willing to pay more for land than the amount of capital which will now yield the same income.

Another reason which leads men to pay more for land than a money loan which will, at the pres-

[1] The author is indebted to Prof. E. B. Skinner, of the Department of Mathematics of the University of Wisconsin, for assistance in the preparation of this formula.

ent time, yield the same income, is the belief that with the progress of society the competition for the use of land will result in a rise in rents, that, while there is a tendency for the annual income which can be derived by lending a given amount of money to decline, there is at the same time and under like conditions a tendency for the income of a given amount of land to increase.

The available land supply of a country usually increases less rapidly than the population, so that it becomes necessary to resort to land which is either less fertile, less favorably situated, or more difficult to bring under cultivation; and as a result of keener competition for the better grades of land the amount which will be offered for the use of such land will rise. While this is what usually happens in the long run, it sometimes happens that the discovery of great quantities of very fertile land, and the invention of better means of transportation making this new land more accessible, will for a time reduce the competition for the land which was already under cultivation, and the rent of such land may, for a time, be reduced; but it is believed that the occasional reactions of this kind cannot permanently counteract the tendency for the price of land to rise.

The land which yields the highest rent at one time may be surpassed in the amount of rent which it will yield at another time, by land which was formerly let for a smaller rent. This may be

the result (1) of the introduction of a new crop which thrives best on the land which for other purposes was counted inferior; (2) it may be the result of a dense population in a region which had formerly been sparsely populated; in other words, the development of a better home market; (3) it may be the result of an improvement in the means of communication which makes the land which was formerly more fertile but less accessible, equally accessible, and hence, more valuable; or (4) it may be the result of a rise in the prices of agricultural produce, or a fall in the current rate of interest, either of which would result in a more rapid increase in the value of land which is more fertile and accessible, but which requires relatively larger expenditures to bring it into cultivation, than in the value of land which is less fertile or accessible but much more easily brought into cultivation. All of these possible variations in the annual value of land must be properly anticipated and included in the list of future incomes which are discounted to find their present values.

Perhaps enough has been said to impress the thoughtful reader with the fact, that to determine the value of a piece of land is by no means a simple matter. When a man sells a piece of land he transfers his right to a series of annual incomes which may be greater or less as time passes by, but which will probably increase as the years go by. In payment for this land he is to accept

another income-bearer which may yield a larger or smaller annual income as the years go by, but which will probably yield a smaller income in the future than at present. This circumstance makes it impossible to do more than approximate the actual present value of a piece of land.

The presence of so many uncertainties makes the buying of land partake more or less of the character of speculation, and during times of prosperity the tendency is for men to be optimistic and over-estimate the probabilities of a rise in rents or a fall in the rate of interest. On the other hand, when periods of depression come, the tendency is for men to underestimate the future possibilities. As a result of this psychological element, the tendency is for the price of land to rise too high during periods of prosperity and to sink too low during periods of depression. As many years are usually required for one of these changes from undervaluation to overvaluation to take place, land does not lend itself so readily to speculation as does wheat, for example; and yet the man with plenty of funds which are available at the right time may win large profits from speculations in land. Speculation if indulged in at the proper time may keep the price of land from falling so low as it might otherwise do in times of depression, and also from rising so high as it otherwise might during times of inflated values. This is true only where the speculator is wise enough to

buy when prices are too low and to sell when the values rise too high. Unwise speculation in land may have the very opposite result.

The study of the rise and fall of the price of land in the United States seems to show that there are times when the price rises rapidly for a few years and then remains stationary for several years. This latter period is usually characterized by the fact that sales of land are relatively few. Land is generally held at the prices which were reached during the period of rapid sales when optimistic views of the future forced the price considerably beyond the present capital value. If sales are made during this dull period they are likely to be at a price appreciably lower than that at which land is usually held, and likely to be a forced sale. The price of land, then, may be illustrated by a curve which rises during one period, remains on the same level or falls during a succeeding period, and then rises again. When viewed for a long period of time, the general rise in land values is evident, but the temporary fluctuations are very important to any one interested in buying land.

The price of land in any given district is influenced by the number and character of the men who desire to be farmers in that district. It often happens that competition for the use of land is keener in some regions than in others, even though the land be as fertile, and the prices of agricultural

products as high in the one place as in the other. Some districts produce more high grade farmers each generation than do other districts, and as a strong motive is required to impel the surplus of farmers to remove to another district, competition in the over-populated district forces the rents and the prices which are paid for land higher and higher until they are appreciably above the level of those which are paid for land in other districts which are capable of producing crops which are just as valuable in terms of money.

Again, it sometimes happens that land is valued for the social standing which accompanies its ownership, as well as for the income in money which it yields. In a country where this is true, and where, at the same time, there are large numbers of persons who have great fortunes and who are very desirous of attaining to a high social position, the prices which may be paid for land often rise far beyond what could be paid if the series of annual incomes in cash were the only factor to be taken into account.

Of two pieces of land which will rent for the same amount, that in one district may sell for a higher price than that in another because there is more money seeking investment in the one place than in the other. A man of wealth will usually rather have his capital invested in land near where he lives than at a great distance where he cannot so readily look after his property, or if he invests

in land at a greater distance he will usually expect a higher rate of return to counteract the disadvantages arising from the distance.

This same principle of capitalization may be applied to other forms of income bearers as well as to land. In estimating the value of a given machine, the farmer may think of the amount of service he is to get out of the machine during the next ten years, let us say, on the assumption that the machine will be worn out in that time. This is a rather difficult process because the deterioration of the machine and perhaps, also, the invention of a better machine to do the same work will result in a gradual reduction in the usefulness of the machine; and yet, if he is to invest wisely in the various forms of capital-goods, the farmer should attempt to estimate the value of the series of uses which may reasonably be expected to be gotten from the particular instrument of production during the time which it shall be at all serviceable, and then find the present value of these future uses by discounting them "at a rate that reflects the prevailing premium on the present."

This *capital value* of the instrument represents the maximum price which the farmer can afford to pay, but does not, of course, necessarily represent the market price of the instrument of production. The market price may be greater or less than the capital value obtained in this way, for the instrument of production may have as many valuations

as there are different grades of farmers to use it and different grades of uses to which it may be put by a given farmer. In order to get a capital value that will correspond more or less closely to the market value of the various forms of capital-goods it will be necessary, therefore, to arrive at the competitive price which will be paid for the use of a given capital-good during the series of years of its usefulness, and then find the present value of the series of incomes, in the same way as has been done in the case of land. But since it is not common in this country to let horses, tools and machinery to farmers for a hire, this method of capitalization is less practical to the farmer when applied to capital-goods than when applied to land.

The cost of producing the machine or the horse is an important element in determining the price which must be paid for it in order that it may be produced. On the other hand, the usefulness of the machine or the horse to the farmer forms the basis for his estimating whether or not he can better afford to pay the market price or do without them. It may be true even that the capital value of the instrument, when calculated on the basis of its usefulness to a given farmer, may be greater than its market value and yet it might be unprofitable for the farmer to buy the particular horse or machine, because other means of securing the same end might prove more profitable.

The theory of capitalization is especially useful in the consideration of the value of farm land because the value of a given piece of land has no particular relation to the cost of bringing such land under cultivation. The income received by the landlord is largely a surplus which is credited to land because it is scarce, rather than because it costs any definite amount to improve the land. Land is also much more permanent in character than are capital-goods, and for this reason, also, it lends itself with more facility to the above method of capitalization.

These are some of the most important principles and conditions which should be kept in mind in the consideration of the values of farm land, and of farm live stock and equipment. The prospective buyer of land will do well to bear in mind the advice of Cato, a Roman agricultural writer, who is quoted by Pliny[1] as saying, "Do not be too eager in buying a farm. In rural operations never be sparing of your trouble, and, above all, when you are purchasing land.—A bad bargain is always a ground for repentance."

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[1] Pliny's *Natural History,* Book XVIII, Chapter 6; "Bohn's Library" edition, Vol. IV, p. 11.

CHAPTER XI

THE FARMER'S MEANS OF ACQUIRING LAND.

Section I. Free land.—Hitherto the progress of American agriculture has been powerfully influenced by the presence of vast areas of government lands which were easily secured, easily brought into cultivation, and which gave large returns upon investments. The presence of these vast areas of cheap land of great fertility in a country where labor was scarce led to the invention of many labor saving devices until America became noted the world over for her agricultural machinery; but, above all, the presence of free land has made the oppressions of landlords impossible. The farmers have been able to take up valuable government lands. This means of acquiring land ownership has been very important from the time the first settlers landed in the New World until the present time. When, in the earlier days, land became scarce in Massachusetts, emigration to Connecticut set in, and when the best lands in both of these colonies were occupied, there still remained unoccupied, good land in New York. When the small farmers of Virginia were

crowded out by the great planters, they found unoccupied lands in North Carolina, and later they followed Boone into the wilderness of Kentucky. In time the occupation of the Mississippi valley was completed, and in more recent years, since the great plains have been made easily accessible by railways, the settlement of new land has gone on at an exceedingly rapid rate.

That the acquisition of landownership was an easy task for the American farmer of the earlier days is indicated by the following quotation taken from a description of the settlements along the Monongahela in 1772 and 1773: "Land was the object which invited the greater number of these people to cross the mountains, for as the saying then was, 'It was to be had here for taking up'; that is, building a cabin and raising a crop of grain, however small, of any kind, entitled the occupant to four hundred acres of land, and a preëmption right to one thousand acres more adjoining, to be secured by a land office warrant."[1]

In 1790 Alexander Hamilton proposed a plan for the disposition of the public lands which reads as follows: "In the formation of a plan for the disposition of the vacant lands of the United States there appear to be two leading objects of consideration: one, the facility of advantageous sales, according to the probable course of pur-

[1] *The Settlement of the Western Country,* by Reverend Joseph Doddridge, In Hart's *American History Told by Contemporaries,* Vol. II, p. 387.

chases; the other the accommodation of individuals now inhabiting the western country, or who may hereafter emigrate thither. The former, as an operation of finance, claims primary attention; the latter is important, as it relates to the satisfaction of the inhabitants of the western country. It is desirable, and does not appear impracticable, to conciliate both. Purchasers may be contemplated in three classes: moneyed individuals and companies who will buy to sell again; associations of persons who intend to make settlements themselves; single persons or families, now resident in the western country or who may emigrate thither hereafter. The two first will be frequently blended, and will always want considerable tracts. The last will generally purchase small quantities. Hence a plan for the sale of the western lands, while it may have due regard for the last, should be calculated to obtain all the advantages which may be derived from the two first classes."[1]

The government was slow in formulating the plan which finally became most significant in the conversion of the public domain into a nation of farms. The American statesmen of the Eighteenth Century looked upon the western lands "as an asset to be cashed at once for payment of current expenses of government and extinguishment

[1] See *The Public Domain*, by Donaldson, p. 198.

of the national debt."[1] This desire to convert the public domain into cash led to the sale of land in large tracts. Under the ordinance of May 20, 1785, surveyed lands were offered in lots as large as a whole township of 32 sections of 640 acres each, for not less than $1 per acre.[2] Under an Act passed May 18, 1796, which provided for the survey of certain lands in the present state of Ohio, surveyed lands were to be offered at public sale in sections of 640 acres, and in lots of eight such sections each. The minimum price was then fixed at $2 per acre.[3] Prior to May 10, 1800, 1,484,047 acres of land had been sold from the public domain for the benefit of the United States. From these sales was realized $1,201,725.68.[4]

Under an Act of May 10, 1800, land offices were opened in the Northwest Territory. The minimum price was kept at $2 per acre. Lands were offered for three weeks at public sale in sections and half sections, and what remained at the end of this period was to be sold privately, as wanted, at the minimum price. During the next twenty years the net sales of government lands were 13,642,536 acres, from which the sum of $27,900,379.29 was realized.[5] In 1820 the minimum price of land was reduced to $1.25 per acre.

[1] See *The Public Domain*, by Donaldson, p. 196.
[2] *Ibid.*, p. 197.
[3] *Ibid.*, p. 200.
[4] *Ibid.*, p. 201
[5] *Ibid.*, p. 203.

The revenue idea was gradually abandoned and the settlement of the western country came to be looked upon as the principal end in view in the disposition of the public domain.

The preëmption system, which gave the preference to actual settlers in the sales of land at the minimum price, was embodied in sixteen special Acts between 1801 and 1841. At the latter date a general Act was passed which, with minor changes, remained in force until 1891. The actual settlers were permitted to enter upon tracts of land not larger than 160 acres nor less than 40 acres before such lands had been offered at public sale. The requirements were that the person should reside in a dwelling upon the tract, improve and cultivate a part of the land, and after a limited period pay $1.25 per acre.

"The preëmption system," says Donaldson,[1] "arose from the necessities of settlers, and through a series of more than 57 years of experience in attempts to sell or otherwise dispose of the public lands. The early idea of sales for revenue was abandoned and a plan of disposition for homes was substituted. The preëmption system was the result of law, experience, executive orders, departmental rulings, and judicial construction. It has been many-phased, and was applied by special acts to special localities, with peculiar or additional features, but it has always and to this

[1] See *The Public Domain*, by Donaldson, p. 215.

day [1880] contains the germ of actual settlement, under which thousands of homes have been made and lands made productive, yielding a profit in crops to the farmer and increasing the resources of the Nation."

The Homestead Act of 1862 was the final step in the direction of free land for actual settlers. This law was the result, in part at least, of the agitations of the Free Soil Democrats. They claimed "that the public lands of the United States belong to the people, and should not be sold to individuals, nor granted to corporations, but should be held as a sacred trust for the benefit of the people, and should be granted in limited quantities, free of cost, to landless settlers."[1]

The homestead law enables the landless farmers to secure a quarter-section, 160 acres, of land and acquire a title to the same by maintaining residence thereupon and improving and cultivating the land for the continuous period of five years.[2]

"The homestead act," says Donaldson,[3] writing in 1880, "is now the approved and preferred method of acquiring title to the public lands. It has stood the test of eighteen years, and was the outgrowth of a system extending through nearly eighty years, and now, within the circle of a hun-

[1] See *The Public Domain*, by Donaldson, p. 332.

[2] Circular from the General Land Office showing the manner of proceeding to obtain title to public lands, 1904, p. 11.

[3] See *The Public Domain*, by Donaldson, p. 350.

dred years since the United States acquired the first of her public lands, the homestead act stands as the concentrated wisdom of legislation for settlement of the public lands. It protects the government, it fills the states with homes, it builds up communities, and lessens the chances of social and civil disorder by giving ownership of the soil, in small tracts, to the occupants thereof. It was copied from no other nation's system. It was originally and distinctively American, and remains a monument to its originators."

Under the homestead law 233,043,939 acres had been entered up to June 30, 1904.

From 1873 to 1891 a Timber Culture Act was in force. This Act, as first passed, enabled "any person" to obtain not more than 160 acres of land by planting 40 acres of timber and properly caring for the same for ten years. The number of acres of timber required was finally reduced to 10, and the period of cultivation to eight years. The privilege came to be restricted, however, to persons twenty-one years of age, heads of families, citizens of the United States, or one who has filed his declaration of intention to become such. The law was a failure from the standpoint of timber culture, but in all 44,229,950 acres of land were entered by this method.

The total area included in farms was more than doubled between 1860 and 1900. The acreage in farms was 407,212,538 in 1860, and in

1900 it was 838,591,774. The importance of free land in this increase in the total area of land in farms is shown by the fact that between January 1, 1863, and June 30, 1900, 188,149,032 acres of land were entered under the homestead laws. It is estimated that public lands had been disposed of by the government prior to June 30, 1860, to the extent of 417,587,322 acres;[1] whereas 524,509,414 acres have been disposed of since that date.

The following figures show the number of acres of land disposed of by the government for each year from 1863 to 1904. In column A is given the acreage of original homestead entries. In column B is given the area disposed of for cash, the total acreage of original entries under the Homestead Acts and the Timber Culture Acts, the total acreage located with agricultural college and other

[1] Donaldson *(Public Domain,* p. 519) says: "The disposition of the public domain from its origin to June 30, 1883, is estimated at about 620,000,000 acres." From this number has been subtracted the sum of the amounts annually disposed of each year from June 30, 1860, to June 30, 1883, or 202,412,322 acres. It will be noted that the total amount disposed of from the origin of the public domain to June 30, 1904, according to these figures is 942,096,736 acres. Whereas according to the report of the Land Office for 1904, the total area appropriated prior to June 30 of that year was 794,794,384 acres. This discrepancy is easily accounted for by the fact that considerable quantities of the land selected by railways or entered by individuals under the various Acts, was restored to the public domain and became subject to entries and selections a second time; 794,794,384 acres represents the net amount disposed of for the whole period, but it is impossible to ascertain the net amount disposed of each year, so the amounts disposed of each year, without regard to the amounts restored to the public domain, are taken as representing the importance of this means of acquiring land.

kinds of scrip, with military bounty-land warrants, and selected by states and railways.

Date.	A. Original Homestead Entries. Acres.	B. Tolal. Acres.
1863	1,040,989	2,966,699
1864	1,261,593	3,281,866
1865	1,160,533	4,513,738
1866	1,892,517	4,629,313
1867	1,788,043	7,041,115
1868	2,328,923	6,655,742
1869	2,737,365	7,666,152
1870	3,698,910	8,095,413
1871	4,600,326	10,765,705
1872	4,671,332	11,864,976
1873	3,793,613	13,030,607
1874	3,518,862	9,530,873
1875	2,356,058	7,070,271
1876	2,875,910	6,524,326
1877	2,178,098	4,849,768
1878	4,418,345	8,686,179
1879	5,260,111	9,333,383
1880	6,045,571	14,792,372
1881	5,028,101	10,893,397
1882	6,348,045	14,309,166
1883	8,171,914	19,430,033
1884	7,831,510	27,531,170
1885	7,415,886	20,995,516
1886	9,145,136	22,124,564
1887	7,594,350	25,858,038
1888	6,676,616	24,485,834
1889	6,029,230	17,036,673
1890	5,531,679	12,798,837
1891	5,040,394	10,477,700
1892	7,716,062	13,664,019
1893	6,808,792	11,891,144
1894	8,046,958	10,406,101
1895	5,009,491	8,406,849
1896	4,830,915	13,209,523

Date.	A. Original Homestead Entries. Acres.	B. Total. Acres.
1897	4,452,290	7,839,117
1898	6,206,558	8,453,897
1899	6,177,587	9,182,413
1900	8,478,409	13,453,888
1901	9,479,275	15,562,796
1902	14,033,246	19,488,535
1903	11,193,120	22,824,300
1904	10,171,266	16,405,822
Total.....	233,043,939	518,027,830

From the above table it will be noted that during the decade from 1890 to 1900, the amount of land disposed of by the government was much smaller than for the decade from 1880 to 1890. This falling off was looked upon at the time as suggesting that all the more desirable lands had been selected from the public domain. Since 1900, however, the number of acres disposed of each year has been much greater,—rising to almost twenty-three million in the year ending June 30, 1903. In 1902, nearly four and one-half millions of acres were disposed of in Oklahoma, and slightly more than two and a half millions in North Dakota. There were five states in which more than one million acres of land were disposed of in 1902, namely, Wyoming, Montana, Oregon, Washington, and Colorado. In 1903, nearly three millions of acres were disposed of in each of the two states, Florida and North Dakota, two millions in Wyoming, and between one and two

millions in Colorado, Mississippi, Oklahoma, Oregon, and Washington. During the past ten years more land has been disposed of by the government in Oklahoma than in any other state or territory. North Dakota ranks second in this respect. These facts suggest that the opening of Indian reservations to white settlers has been the most prominent factor in bringing about an increase during the last few years in the number of acres disposed of by the government.

That the free distribution of farms will soon reach its limit is shown by the fact that three-fourths of the total land area of the United States, exclusive of Alaska and the insular possessions, has been appropriated or reserved. Out of the total area of 1,900,947,200 acres, there yet remain about 473,836,000 acres unappropriated and unreserved. Of this 270,267,760 acres have been surveyed. This land which is still open for appropriation is found principally in Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, North Dakota, Oregon, Utah, and Wyoming. Most all of the land which is desirable for agricultural purposes has been appropriated or reserved. When an Indian reservation is now thrown open to settlers there are many applicants for every desirable piece of land. In the summer of 1904 there were in one case 106,308 persons registered with the hope of drawing farms where

there were but 2,412 pieces of land of 160 acres each for distribution.[1]

The presence of unoccupied lands of good quality which has, hitherto, made the task of acquiring landownership an easy one in this country, will be of less and less significance as the years go by, and other considerations will become more and more important. This leads us to study the importance of gift and inheritance as means of acquiring landownership.

Section II. Gift and Inheritance.—A vast amount of wealth passes on from generation to generation by gift and inheritance. Hence it is not necessary, in order to maintain the class of landowning farmers in a country where this class is already established, that each succeeding generation of farmers should save from the profits of their industry sufficient wealth to purchase their farms, and to hand this accumulated wealth over to the preceding generation of landowners. This would be necessary, however, in order to reëstablish a class of landowning farmers in one generation in a country where landlordism has become universal. In England, where most of the land is owned by a comparatively small number of landlords, the estates are handed down from generation to generation and thus remain the property of the landlord class; and in that country it is

[1] General Land-Office Report, 1904, p. 13.

unusual indeed for a tenant farmer to undertake to purchase a farm. In Germany, where peasant proprietorship is the rule, the farms are handed down from father to son by inheritance, and thus the property is kept in the hands of the tillers of the soil. The conditions with respect to inherited wealth are, therefore, of great importance in determining the status of farmers with respect to landownership.

In the United States it is a matter of common observation that farmers who are able to do so, assist their sons in buying farms. This assistance may be relatively very great in the case of a wealthy farmer who has a small family; and again it may be very small in the case of a farmer in moderate circumstances, who has a large number of children among whom he wishes to distribute his assistance. Often the home farm is greatly enlarged by purchasing a "forty" here and an "eighty" there while the boys are growing to manhood, and then parceled out as the young men wish to establish homes for themselves. Again, when the parents are gone, the remainder of their accumulated wealth passes by inheritance to their sons and daughters and helps very greatly in the enlargement of their farms as their growing families make larger farms desirable.

The movement of population from country to city, which has been so great in recent years in

this country, results in the movement of a vast amount of wealth away from the agricultural industry, which must be replaced from some source if the wealth of farmers is not to decline. The general principle may be thus stated: The greater the amount of land and other forms of wealth acquired by one generation and transmitted to the farmers of the next, and the more evenly this wealth is distributed, the greater the ease with which the ownership of land may be acquired by the succeeding generations of farmers; but the larger the farm families of a given community, and the larger the percentage of each succeeding generation who seek a livelihood in other industries, the greater the amount of wealth which will be drawn from agriculture into other industries by gift and inheritance, and the smaller the part which inherited wealth will play in the acquisition of landownership.

The number of persons employed in the various other occupations has increased much more rapidly than has the number engaged in agriculture. This is shown by the following table which gives the proportion of those engaged in all gainful occupations, which were employed in "agricultural pursuits."[1]

[1] *Twelfth Census of the United States*, 1900, Special Reports, Occupations, pp. xxx, l.

Date	Percentage Engaged in Agriculture
1820	87.1
1840	77.5
1870	47.5
1880	44.3
1890	39.2
1900	35.6

Perhaps the most important explanation of this more rapid increase in the percentage of those engaged in other occupations than agriculture, is the transfer of a share of the agricultural population to the other industries. This has often been spoken of as the movement from the country to the city. Men who have long been farmers sometimes move to the cities and enter other occupations, but what is more significant than this is the movement of the farm boys from country to city. A large percentage of the boys who are brought up in the country are educated and sent into the city, where they enter occupations of every description. A large percentage of the men who control the industries of cities to-day were one time farm boys.

This movement from country to city has been especially rapid in the last twenty years and that for two reasons: First, agricultural methods have been transformed by the introduction of labor-saving machinery, until a much smaller percentage of the total working population is required to produce the same supply per capita of

food stuffs and raw materials. Second, the manufacturing industries have been developing rapidly during the same period, giving opportunity for a share of the increasing farm population to find remunerative employment in the industries of the cities. To quote Dr. A. C. True, "Between 1870 and 1890, speaking relatively and in round numbers, two million men gave up farming and went to join the great army of toilers in our cities. Taking their families into account, six million people from the farm were added to the population of the town. . . . Men leave the farms because they are not needed there. The introduction of labor saving machinery and rapid transportation has produced the same result in agriculture as in manufactures. A smaller number of men working in our fields turn out a much greater product than the greater number of laborers could possibly secure in olden times, and the products of all lands are easily carried where they are needed. . . . Within the past twenty-five years, invention has gained the mastery in agriculture as in other arts. The brain of man has triumphed over his hand here as elsewhere."[1]

If only the poor moved from country to city, the total wealth of the country would be affected but little by this movement of population. But the rich farmers are quite as apt to move to the cities as are the poor ones, in fact they are per-

[1] A. C. True, *The Arena*, Vol. 17, pp. 538-9.

haps more likely to do so, for they are in a position to live from the rent of their farms as many retired farmers are doing in nearly every town of the country. The sons of the well-to-do farmers are more likely to receive an education and to be attracted to other pursuits than are the sons of poor farmers; on the other hand, it may be true in many cases that the son of a poor farmer would be more likely to seek employment in the city because his chances of getting a start in the country are not so good as those of the young man with a well-to-do father to aid him.

This stream of population is carrying a vast amount of wealth from country to city every year. This movement of wealth from country to city has rightly been given as one cause of an increase in the percentage of tenancy, for it transfers to the city the owners of many farms, and these farms are cultivated by tenants until some farmer is able to acquire its ownership by transferring to the city-owner an equivalent amount of wealth.

Thus while gift and inheritance are economic conditions of great importance in determining the status of farmers with respect to landownership, and make any rapid change in their status in this regard impossible, some other means of accumulating wealth must be available if the present percentage of landowning farmers is to be maintained. This leads to the investigation of savings

in agriculture as a means of acquiring landownership.

Section III. Savings.—The process of saving from the earnings of many years and making a purchase, is a means of acquiring landownership which is of especial significance in the consideration of the conditions which make it possible for tenant farmers to become landowners. The majority of the tenants are able to save from their earnings, because their net returns are more than enough to cover the expenses of living. When long periods of time are taken into consideration, the prices of agricultural products tend to be such that the total product of the least capable farmer who can remain permanently in the business will equal his cost of living and all other annual expenditures, including rent and normal returns on permanent investments. This is true partly because long-time-average prices are a most important factor in determining the degree of efficiency which is necessary for making a living by farming, and all who do not prove themselves efficient to that degree must leave agriculture to those who are more capable; again, it is true partly because the long-time-average price must be such as will encourage the production of sufficient produce to supply the effective demands of the people, and the least capable farmer who is required to produce this supply must receive prices which will enable him to live in accordance with his idea of

a living, to pay rent, wages (unless he and his family do all the work, in which case this item is included in a living), wear and tear on machinery and normal returns on permanent investments. It is true, certainly, that, at any given time, there are those who are producing at a loss, others who are just able to make both ends meet, and still others,—and ordinarily this class includes the vast majority,—who are able to make an extra profit because of their superior ability. This will be easily understood if we refer to the figures which are available showing the cost of producing maize.[1] From the figures published by the Illinois Experiment Station, it is possible to compile a list showing the variations in the cost of producing maize, which list shows that in the vast majority of the cases reported the cost of producing the maize was far below the market price. The items included under costs are: breaking stalks, plowing, disking, harrowing, rolling, planting, cultivating, husking, seed maize, and rent. The numbers are averages for counties; but as the average number of returns per county was not more than four, the process of averaging by no means eliminated the variations, and the figures show wide differences in the costs of producing maize.

The following figures show the costs, per

[1] *Bulletin No. 50* of the Illinois Agricultural Experiment Station, Table 1.

bushel, of producing maize in Illinois as presented in Bulletin No. 50. Before each statement of costs is placed in parenthesis the number of returns averaged. The county averages are so arranged that they read in succession from the highest to the lowest cost of production. (2) 38.8, (2) 31.5, (1) 29.5, (2) 28.5, (1) 26.8, (2) 25.8, (1) 25.4, (2) 25.4, (4) 23.9, (2) 22.2, (1) 22.1, (2) 22.0, (2) 21.8, (1) 21.0, (1) 20.5, (6) 20.4, (6) 19.7, (2) 18.8, (2) 18.6, (3) 18.3, (1) 18.2, (4) 18.2, (5) 18.2, (2) 17.7, (5) 17.6, (4) 17.6, (5) 17.5, (4) 17.4, (8) 17.3, (6) 17.3, (9) 17.3, (6) 17.3, (2) 17.2, (4) 17.2, (2) 17.0, (3) 16.9, (3) 16.9, (12) 16.9, (2) 16.8, (8) 16.7, (6) 16.6, (1) 16.3, (3) 16.1, (4) 16.1, (1) 16.1, (1) 15.6, (1) 15.6, (3) 15.6, (23) 15.5, (3) 15.3, (3) 15.2, (1) 15.2, (4) 15.2, (2) 15.1, (2) 15.1, (7) 15.0, (4) 15.0, (3) 14.9, (2) 14.7, (1) 14.6, (4) 14.6, (2) 14.2, (8) 14.2, (4) 14.0, (8) 13.5, (2) 13.4, (2) 13.2, (2) 12.7, (1) 12.4, (2) 12.4, (1) 12.2, (1) 11.8, (6) 11.6, (6) 11.3. — These figures show a variation in the cost of producing maize, ranging from 38.8 to 11.3 cents per bushel. Could the returns of the separate producers be compared, instead of the county averages, a wider variation in costs would doubtless be found.

This differential gain, or profit due to superior ability is the condition which, even where gift and inherited wealth are insignificant, make it

possible for farmers to accumulate wealth and to become the owners of farms. It is true, certainly, that the more efficient may live much better than the least capable, or marginal farmers, and thus the habits of life may reduce the power of the more efficient farmers to save from their profits. But the condition which gives rise to this differential gain certainly makes it profitable for the more efficient tenant farmers to buy land.

The greater the number of those who have gained a degree of efficiency above that of the marginal farmers and the greater the difference between the degree of efficiency of the majority of farmers and that of the marginal farmers, the greater is the differential gain which will go to farmers as personal profits, and the better able they will be to become landowners. On the other hand the more homogeneous the farmers who supply the market, that is, the smaller the number who have gained a degree of efficiency above that of the marginal farmer and the less this degree of difference, the smaller is the total differential profit and the less able are tenant farmers to accumulate sufficient wealth to buy a farm.

Section IV. Credit.—It is a common practise in the United States for farmers to borrow money to invest in land. When a young man has saved enough money to pay some share, say half or two-thirds of the price of the farm, he borrows the remainder and makes an investment, a mortgage

being given to secure the loan. This enables the farmer to buy land much sooner than he could if he were required to save the entire amount before making the purchase. Where too high a rate of interest is not charged, it is often more desirable to pay interest than to pay rent; for the difficulty of adjusting the relations between landlord and tenant is in this way removed, and the farmer is free to improve the land as he chooses, knowing the benefits will be his own.

A study of the mortgage indebtedness of farmers in the United States, in 1890, showed that 18.6 per cent. of all the farm families occupied encumbered farms. The total encumbrance of farm homes amounted to $1,085,995,960, which was thirty-five per cent. of the total value of the encumbered farms, and 8.2 per cent. of the total value of all farms.[1] An investigation of the distribution of farm mortgages[2] showed that throughout the southern states where the percentage of tenancy was very high, the percentage of encumbered farms was very low; that the six states having the highest encumbrance on farms were New York, Iowa, Illinois, Kansas, Ohio, and Pennsylvania; the total encumbrance of these states being $553,964,594, or 51 per cent. of the total for the United States; yet with this high total encumbrance, the mortgages represented

[1] Eleventh Census, *Report on Farms and Homes*, p. 58.
[2] *Ibid.*, pp. 58, 66, 69.

only 37.25 per cent. of the value of the encumbered farms, and 9.86 per cent. of the total value of all farms in these six states. Thus while a large per cent. (51.) of the farm-mortgage indebtedness of the United States is concentrated on a small area, there is also a large per cent. (42.3) of the farm values concentrated on the same area.

The following quotation from the Census Report, throws much light upon the reasons why mortgages are placed upon land:

As a result of inquiries made in 102 selected counties, distributed throughout the United States, the conclusion is that 80.13 per cent. of the mortgages in force were made to secure the purchase price of real estate and to make real estate improvements, when these objects are not complicated with other objects, and that the original amount of these mortgages is 82.66 per cent. of the total original amount of all mortgages in force. If to these objects are added the objects of business and the purchase of various articles of personal property of the more durable kind, such as domestic animals, wagons, farm machines, when not combined with other objects, the mortgages are 89.82 per cent. of the entire number in force, and their original amount is 94.37 per cent. of the total original amount of all mortgages in force. . . . . The mortgages distinctly representing a loss of wealth, or wealth soon to be consumed, are embraced in the description of farm and family expenses, and their number is 5.4 per cent. of the total number of mortgages in force, while their original amount is 1.73 per cent. of the total original amount. . . . . A distinction must be observed between the cause and the consequence of mortgages. The mortgage, in its motive, is for the most part a mere business venture, and, so far as foreclosures show, for the most part

a successful one. It becomes a misfortune when for any reason it becomes a business mistake.[1]

These figures, it is true, refer to real-estate mortgages generally; but there is no reason for thinking that the mortgage is used for other than the securing of the purchase price of real estate in the case of farm mortgages than in the case of other real estate mortgages. In general, we would be inclined rather to think that farm mortgages were more likely to be given to secure the purchase price than the mortgages on city lots, for example, where the total value of the lot might be relatively small compared with the value of the business which might be established thereon, and which might be an occasion for desiring to mortgage the real estate to secure funds to extend the business. In general, the conclusion which should be drawn seems to be that the mortgages on farms are in the vast majority of cases used as a means of making the transition from tenancy to landownership.

The evidence seems to show, also, that the farmers are usually successful in their use of the mortgage as a means of acquiring the ownership of land. In Illinois, Michigan, Minnesota, and New Jersey, from one-third to one-half per cent., only, of the farm mortgages are foreclosed each

[1] Eleventh Census of the United States, 1890, *Report on Real Estate Mortgages*, p. 310.

year;[1] and the average duration of farm mortgages in the United States is about five years.[2] From this we may conclude that in the above named states not much more than from one and two-thirds to two and one-half per cent. of the farm mortgages are foreclosed. But we cannot argue from this that from ninety-seven and one-half to ninety-eight and one-third per cent. of the mortgages are duly paid, out of the profits of agriculture. Many cases will come to the mind of the reader, where the unsuccessful aspirants to landownership have sold their mortgaged farms in order to pay off the mortgage and save a part of their original investment. However, it is fair to say that the vast majority of such adventures prove successful.

A classification by age groups of the owners of farm homes, in the United States, may be obtained for the years 1890 and 1900, which gives the percentage of the owned farm homes which are encumbered. This classification is shown in the following table:[3]

[1] George K. Holmes, *Quarterly Journal of Economics*, 1896, Vol. X, p. 49.

[2] Eleventh Census, *Report on Farms and Homes*, p. 109.

[3] These figures were calculated from the *Report on Farms and Homes for* 1890, and from Vol. II of the census for 1900.

TABLE 5. THE PERCENTAGE OF OWNED FARM HOMES WHICH WERE KNOWN TO BE ENCUMBERED, IN THE NORTH CENTRAL DIVISION, IN 1890 AND 1900, CLASSIFIED BY THE AGE OF THE OWNERS.

Age	Percentage Encumbered 1890	1900
Under 25 years	40.7	43.6
25 to 34 years	49.5	48.3
35 to 44 years	49.1	48.3
45 to 54 years	44.5	41.5
55 years and over	32.1	32.2

From these figures it will be seen that the percentage of encumbrance increases from youth to middle age, and declines from middle age to old age. This fact, and also the relation between the increase in the percentage of mortgages and the decline in the percentage of tenancy, is shown more clearly in the following table in which the one state of Illinois is considered, Illinois being the one of the northern states in which the percentage of tenancy is the highest:

TABLE 6. THE PERCENTAGE OF OWNED FARM HOMES WHICH WERE KNOWN TO BE ENCUMBERED, AND THE PERCENTAGE OF ALL FARM HOMES WHICH WERE KNOWN TO BE HIRED, IN THE STATE OF ILLINOIS, FOR THE YEAR 1900.

Age	Encumbered Homes	Hired Homes
Under 25 years	40.1	74.64
25 to 34 years	47.9	63.25
35 to 44 years	46.2	42.50
45 to 54 years	38.8	29.8
55 to 64 years	31.2	18.29
65 years and over	21.9	10.60

When we consider the mortgage in all of its relations it is apparent that this is one of the important means of acquiring landownership; and while it sometimes proves disastrous, it is practically indispensable in our rural organization, and on the whole it may be looked upon as an institution friendly to the interests of the farmers.

Section V. The taxation of mortgages.—It has been noted by economists that the market price of land is often greater than the capitalization of the net rent at the current rate of interest. That is, men are willing to take a lower return on investments in land than on loans, even where the security is a farm mortgage. This is said to increase the difficulty of paying off farm mortgages. The man whose farm is mortgaged must pay, for example, six per cent. for the use of money which, as an investment in land, is yielding him no more than four per cent.

With the Ricardian theory of distribution in mind, which assumes that all farmers possess the same degree of efficiency, economists have concluded that this discrepancy between the net rent and the interest would make it practically impossible for the farmers to pay off their mortgages. It will be readily understood from the discussion of *profits due to superior ability,* that all but the less efficient farmers are able to counterbalance this loss by earning personal profits, so that the fact of the discrepancy is not so disastrous as has

been supposed by the economists; yet this discrepancy has an important retarding influence upon the movement from tenancy to the unencumbered ownership of land.

This difference between net rent and interest is due to many causes. Many of these causes have already been discussed in the chapter on the price of land; but we wish to emphasize especially the influence of double taxation in this connection. Double taxation, the taxing of both the farm and the mortgage upon the farm, tends to increase the difference between the rate which must be paid upon the loan and the returns received upon investments in land. The man who lends money upon a mortgage wants at least as large a return as if he had purchased the land himself. Had the man who lent the money purchased the land and rented it, he would have paid the land tax out of the net rent. If he lends the money and has to pay tax at the same rate on the mortgage, he will demand interest equal, at least to the net rent of that proportion of the farm represented by the face of the mortgage. This means that the farmer will have to pay interest equal to the net rent and then pay the land tax besides; thus paying more in interest and in the tax, by the amount of the tax, than he would have paid as a tenant. To tax a farm mortgage is, therefore, to tax a farmer for using the mortgage as a means of acquiring landownership.

Section VI. The need of a system for obtaining credit on land, the District Credit Associations in Germany.—The farmers of the United States are in need of a good credit system. Not only is it important that the young farmers who wish to go in debt for land should be able to borrow money at a low rate of interest; but it is equally important that the tenant farmers should be able to invest their savings in a profitable manner, until they have accumulated sufficient capital to enable them to invest in land. It is well known that the country bankers are not willing to pay more than four per cent. for the savings which the farmers may deposit with them; and that these same bankers will not lend money to the same men, on the best of security,— the farm mortgage,—for less than six per cent. with the interest paid semi-annually in advance. It is also true that the length of time for which the farmers wish to borrow money is usually longer than that for which the bankers wish to put their money out; in fact, the lending of money on mortgages is not the class of investment which seems most congenial to the ordinary banker.

The banks are of far less importance in the making of loans to farmers for the purpose of buying land, in most communities, than are the well-to-do and the retired farmers of the neighborhood. Nearly every community has at least one such man in it. While there are many exceptions,

these men are usually close-fisted, and more or less miserly in character. They are not willing to take any risk. They lend to the men whom they know. They take mortgages on land, the value of which they can readily ascertain. Some of these men, perhaps the most of them, deal honorably; but they charge a higher rate of interest than the farmers can well afford to pay. But while some, perhaps the most, of these men who lend money to the farmers deal honorably, there are men in this business who have rightly been called "land sharks." These men watch for a chance to foreclose a mortgage and get a farm for much less than its real value. Having the farm in their possession they wring all they can from the tenants who are so unfortunate as to contract for the land, or they sell it to some farmer who gives a mortgage in part payment; this done the land shark watches his chance to get the farm again for much less than the price for which he sold it, as he had done before, and so the process is continued until untold damage is done to his fellowmen.

Besides these moneyed men who live in the neighborhood and lend money to the farmers, there is usually some one who acts as the agent of some large insurance company, and whose business it is to lend the funds of the company to the farmers. These loans are secured by mortgages. The company is in no hurry for the money, and has no use for the land. The main objection to

this means of borrowing money is the rate of interest, which is usually higher than it should be, and higher than the farmers would have to pay for the use of money if they had the benefit of a good credit system.

But neither the local money lender nor the agent of the insurance company provide the farmers with a means of investing their savings. The young farmer who saves but a few hundred dollars each year, cannot hope to lend this money on a mortgage, because those who wish to borrow money to invest in land generally desire a larger sum at one time. Hence the farmer finds the country bank with its low rate of interest, about the only chance for investing his savings during the years when he is trying to accumulate enough capital to enable him to invest in land. When the time has come for him to make an investment by paying half of the value of a piece of land from the savings of many years, he is embarrassed by the fact that while he has been able to get no more than four per cent. for the use of his money, he must pay six per cent. for the money which he wishes to borrow. This should certainly be enough to convince the farmer that something is wrong. The important question is, Can anything be done to remedy this condition of affairs? Something has been done in other countries, and there is no reason why something cannot be done in this country to give the farmer a better

credit system. More than a hundred years ago institutions were established in Germany for the purpose of lending money to the farmers at a low rate of interest; and the years have proved the wisdom of this course of action. The most important institutions for making loans to farmers, in Germany, are the district coöperative credit associations (*Landschaften*) which are public, or semi-public institutions for the purpose of lending money on mortgages. These are organizations of landowners, who by combining their resources into an unlimited company are able to borrow money at a very low rate,—at a rate comparable to that for which the government can float its bonds. As the institution is not intended for profit, the loans are made to landowners at a rate just enough higher than that paid by the institution to cover the costs of carrying on the business. Money is loaned on mortgages to the farmers and in order to raise the money for such loans, the institution is permitted by public authority to issue *mortgage bonds* to the value of the mortgages it holds. As all the members of the association are jointly and severally liable to the full value of their lands, the bonds are considered excellent investments, and are floated at a very low rate of interest.

When the money has been lent to a farmer and a mortgage given to secure the loan, it is the regular thing to collect a small amount as a partial

payment each year until the whole amount is paid. If, for example, the rate of interest charged by the institution is four per cent., five per cent. will be collected each year. Four per cent. is interest and the one per cent. is a partial payment which accumulates with interest until at the end of a little over forty years sufficient has been paid in to cancel the debt. It is also possible for the more thrifty farmers to make other payments which shorten the period required for canceling the debt. In some cases, these partial payments must be paid in mortgage bonds, which can be bought at the market price.

These mortgage bonds make a safe and ready means of investing the farmers' savings. In them the farmer finds a safe investment which is as permanent as he may desire to have it, and at the same time an investment on which he can realize at any time in case he decides to invest in land. The German form of the institution may not exactly meet our needs, but it is certainly true that the principle of association is especially desirable in any system of land credit.

Not only do such institutions make it possible for the young farmers to invest their savings until they are ready to buy, and then to borrow money to finish paying for the land, but they make it more desirable for the retiring farmers to sell their land, as they can invest in bonds which are as safe as the investment in land and pay practically the

same returns. Thus it is that a good credit system is the best means of precluding the presence of the tenant problem.

The safety of these institutions is insured by the fact that they are *district* associations. Each institution operates only within a very limited and well defined field, so that the officials are able to know the men and the land values throughout the district.

The good effect of this credit system is evinced by the fact that, in 1895, only 16.42 per cent. of the farms of Germany were composed entirely of leased land; and only 12.38 per cent. of all the land included in farms was leased land. Indeed, Germany is a nation of landowning farmers, while in France 47.2 per cent. of the cultivated area is occupied by tenants, and in England the landowning farmer is rarely found.

Tenancy in Germany is largely among the occupiers of the very large and of the very small farms. This is shown in the following table:

TABLE 7. PERCENTAGE OF THE FARMS OF VARIOUS SIZES IN GERMANY WHICH WERE COMPOSED SOLELY OF LEASED LAND, IN 1895.

Under 5 acres	19.91
5 to 12.35 acres	3.54
12.35 to 49.4	1.97
49.4 to 247 acres	4.64
247 acres and over	25.68

Not only is the percentage of tenancy low, but the statistics fail to prove any important change

in this regard in recent years. In 1882, 15.71 per cent. of the farms were composed solely of leased land, and in 1895 the percentage was 16.42; but at the same time, 12.88 per cent. of all land in farms was leased land in 1882, and only 12.38 per cent. in 1895. It would appear, therefore, that there was little change in the status of the farmers with respect to landownership during this period.

That this high percentage of landowning farmers is due in a large degree to the good system of land credit, is indicated by the fact that the farms of Prussia, are mortgaged to about half their market value. And yet it may be that in this high percentage of indebtedness there lies a danger. The indebtedness on land in Prussia increased twenty-four per cent. during the thirteen years from 1883 to 1896; and it may well be feared that while the forms of landownership have been retained the real ownership is gradually slipping away from the farmers as surely as it is in our own country.

Even if the good credit system is not all that is needed to enable the tenant farmers to become landowners in sufficient numbers to stop the decline in the percentage of landowning farmers, yet it is certainly an important method of facilitating the acquiring of landownership on the part of the farmers, and in this way it is a means of checking to some extent the decline of the class of land-

owning farmers in the United States. Gift, inheritance, and profits, aided by a good credit system are the most important means of acquiring the ownership of land. Now that the government has practically exhausted its supply of good farms, and competition is driving the price of land higher and higher, it becomes more and more important that every facility be provided the farmer for making the most of the means which yet remain for acquiring the ownership of land. The farmer should have every facility for acquiring a knowledge of the facts and principles which underlie his art, in order that he may so operate his farm as to win large profits from which to save money to invest in land. He should be provided, also, with a credit system such as will enable him to invest his savings with profit, and provide an economical source of funds, such as will avoid high rates of interest and double taxation, when it is desirable to borrow money to invest in land.

PROBLEM ILLUSTRATING THE FOREGOING PRINCIPLES.

1. Four farmers, A, B, C and D, are in competition for four grades of land, 1st, 2nd, 3rd, 4th. The following figures represent the value of the produce which the farmers of each grade can produce on the land of different grades as a result of the expenditure of six dollars' worth of labor and capital.

	Grades of Land.			
Grades of Farmers.	I.	II.	III.	IV.
A	13.5	12.	10.5	9
B	12.	10.67	9.33	8
C	10.5	9.33	8.17	7
D	9.	8.	7.	6

(a) How much differential rent would be paid for the amount of land employed in each case (allowing 5 cents as a margin in each case)?

(b) Supposing that the six dollars are expended upon one acre in case of the fourth grade land, and that the third grade land is farmed 5 per cent. more intensively than the fourth grade, and the second grade 10 per cent, and the first grade 15 per cent. more intensively than the fourth grade, how much would the rent per acre be on each grade of land?

(c) Supposing that the net rent is 90 per cent. of the gross rent, and that the current rate of interest on safe loans is five per cent., what would be a fair capitalization of the income of each piece of the land?

(d) Supposing that all farmers live equally well, and leaving out of account the influence of variations in quantitative efficiency, how long would it take each man to pay for the land which he cultivates by saving from his profits if the land can be purchased at its capital value?

CHAPTER XII

TENANCY AND LANDOWNERSHIP IN THE UNITED STATES.

Less than two-thirds of the whole number of farms in the United States are cultivated by their owners. According to the census for 1900, twenty-two and two-tenths per cent. of the farms were operated by share tenants, thirteen and one-tenth per cent. by cash tenants, one per cent. by managers, nine-tenths per cent. "by owners and tenants," seven and nine-tenths per cent. by "part owners," and fifty-four and nine-tenths per cent. by owners. The following table shows the percentage of all farms which were operated by these different classes of farmers in the United States and in the geographic divisions of the country, as shown by the census for 1900.[1]

[1] N. B.—The following instructions to the enumerators explain the significance of the terms used in the following table:

"OWNER.—If a farm is cultivated by a person who owns all or a part of it, by a man whose wife owns all or a part of it, by a widow or widower, by the heir or heirs thereto, or by the trustees or guardian for such heirs, write 'owner.' For census purposes a settler on government land who has not 'proved up,' a person who has bought land on a contract for a

TABLE 8. TENANCY AND LAND OWNERSHIP IN THE UNITED STATES IN 1900.

	Owners	Part Owners	Owners and Tenants	Managers	Cash Tenants	Share Tenants
United States.....	54.9	7.9	.9	1.0	13.1	22.2
Geographic divisions						
North Atlantic....	72.3	4.0	.9	2.0	9.8	11.0
North Central	57.9	12.1	1.2	.9	7.5	18.4
South Atlantic....	49.3	4.9	.6	.9	18.0	26.3
South Central	44.8	5.2	.8	.6	17.3	31.3
Western	69.6	10.1	.6	3.1	7.7	8.9
Alaska and Hawaii	30.5	6.1		5.6	54.9	2.9

This table shows that the percentage of tenancy is the highest in the Southern divisions and the lowest in the Western division. Farms operated by managers are relatively most abundant in the Western and in the North Atlantic divisions. In the West the farms operated by managers are largely cattle and sheep ranches which are conducted for profit, while in the East these farms

deed, or a person who holds over for redemption, is an owner and must be so marked.

"OWNER AND TENANT.—If a farm is cultivated jointly by its owner and by one or more other persons working for a share of the farm products, write 'owner' after the name of the owner, and 'share' after the tenant on shares.

"MANAGER.—If the farm is cultivated for its owner, or public institution, by a salaried manager, superintendent, or overseer, write 'manager.'

"CASH TENANT.—If the farm is cultivated by a tenant who pays a fixed rental in money, or a stated amount of labor or farm commodities (not a proportionate share of all), write 'cash.'

"TENANT ON SHARES.—If the farm is cultivated by a tenant who pays for its use a share (as one-third, one-half, or other proportion) of the crops raised, write 'share.'" (See Twelfth Census of the United States, 1900, Vol. V, p. 759).

represent, in many cases, the country homes of wealthy families.

The three classes, farms operated by, "owners, part owners, and owners and tenants," may be grouped together as including the farms on which the owners have a direct share in the management of the land. These three classes of farms represented 63.7 per cent. of all farms in the United States; while the percentage was 78.2 in the North Atlantic division, 71.2 in the North Central division, 54.8 in the South Atlantic, 50.8 in the South Central, and 80.3 in the Western division.

The cash and share tenants, taken together, operate 35.3 per cent. of the total number of farms in the United States. These rented farms represent 30.2 per cent. of the "improved area" in farms, and 23.3 per cent. of the total area in farms. These same farms represent 28.4 per cent. of the total value of the farm land and buildings, being 30.1 per cent. of the total value of all farm land (exclusive of the value of buildings), and 22.7 per cent. of the value of all farm buildings.

Section I. The decline in the percentage of landowning farmers in the United States.—There were no statistics available on the subject of landownership, in the United States, prior to 1880. The census of 1880 showed that 74.44 per cent.

of the farms were operated by owners, while 25.56 per cent. were operated by tenants. This condition of affairs gave rise to much discussion concerning the probable future of the American farmer. Some writers considered tenancy a transitionary stage to landownership, while others contended that those who once had owned land finally lost it and became tenants,—that in time tenancy would become general.

In 1886, David B. King said:[1] "While there are exceptions, and tenants are found who are unthrifty, or whose lot is a hard one, as a rule the American tenant farmer prospers, and in very many cases passes from the tenant to the landowning class. It is a decided advantage to many an agricultural laborer and farmer's landless son that numbers of owners of farms have become so prosperous that they do not care to till the soil themselves [and for this], or, for other reasons rent their land. It often happens that a young man, engaged in agriculture or other labor, by thrift and economy, lays by enough to stock a small farm which he rents 'on shares' or for a fixed sum. In a few years he saves enough to buy the property, paying perhaps one-half of the purchase money at once, and the remainder in annual payments extending through several years. The former owner is secured by a mortgage on the farm. By the time the man has reached mid-

[1] *North American Review*, Vol. 142, pp. 256-7.

dle life he owns the farm free of debt. . . . It is not surprising that the casual observer, seeing many owners apparently deeply in debt, should be alarmed at the state of things. On closer observation one finds, however, that in most cases, the hard-working tenant and the interest-paying owner are both prosperous and rapidly becoming independent."

Mr. Henry Strong, whose business it was to sell railroad lands and lend money on farm mortgages, said:[1] "Just after the panic of 1873, and during the years 1874, 5, and 6, I loaned several hundred thousand dollars in Illinois and Iowa upon farm mortgages, and all of these loans, with two exceptions, were paid. These exceptions were in cases of large farmers, who were speculating in cattle in the Chicago market, failed in business, and turned over the mortgaged lands to me, aggregating about three thousand acres of mostly cultivated farms, which I divided up and rented to about a dozen tenants. These lands were afterwards nearly all bought by these tenants, and so far as I know, owned by them or their grantees. . . . . I could cite a great many similar instances." This quotation, which was published in the same number of the same magazine as that quoted from Mr. David King, corroborates the generalizations made by the latter.

But while many held this view there were

[1] *North American Review*, Vol. 142, p. 251.

others who believed that the movement was rather from free ownership of farms to encumbered ownership, and finally to the ranks of the tenant class. In a later number of the same magazine Henry George responded to the articles by Messrs. King and Strong as follows: "Tenancy is not the normal state of man, and is so far from being the primary condition of American agriculture that we have been accustomed to look on the American farmer as necessarily the owner of the acres he tilled. Mr. Strong would have us think, and Professor King really seems to think, that tenant farming is, in the natural order of things, the intermediary stage through which 'Agricultural laborers' are enabled to pass into a condition of landowners, just as, in the older handicrafts the condition of journeyman was the intermediary condition between that of apprentice, with which all craftsmen must begin, and that of master workman, to which all could aspire. The truth is just the reverse of this. Tenant farming is the intermediary stage through which independent tillers of the soil have in other countries passed, and in this country are now beginning to pass, to the condition of agricultural laborers and chronic paupers.

"But sufficiently startling as is the fact that in 1880, more than one-fourth of American farms were cultivated by tenants, this of itself does not fully indicate how largely our agricultural popu-

lation have already been divorced from the soil. Tenancy is only the later form of the disease; the earlier form is the mortgage."[1]

Three sets of statistics on tenancy and landownership, those for 1880, 1890, and 1900, are now available, and a comparison of these figures shows that there has been a decline in the percentage of landowning farmers in the United States since 1880. The extent of this decline is shown in the following table:[2]

TABLE 9. TENURE OF FARMS IN THE UNITED STATES.

Date	Percentage of Farms Operated by		
	Owners	Cash Tenants	Share Tenants
1880	74.5	8.0	17.5
1890	71.6	10.0	18.4
1900	64.7	13.1	22.2

This table shows a decline of nine and eight-tenths in the percentage of landowning farmers during the last two decades of the Nineteenth Century; and the decline has been more rapid during the decade from 1890 to 1900 than during the preceding decade.

This decline in the percentage of landowning farmers does not necessarily imply, however, that farmers who once owned land have lost it and become tenant farmers. The ownership of land is ever changing. If all farmers were to cease acquiring the ownership of land for one generation, there would be no landowning farmers left; and

[1] *North American Review*, Vol. 142, p. 393.
[2] Twelfth Census, Vol. V, p. lxxvii.

this could happen without a single farmer becoming bankrupt and losing his farm.

The decline in the percentage of landowning farmers is due largely to the fact that a decreasing percentage of the succeeding generations of young farmers are able to acquire land. This is shown in the following table:

TABLE 10. PERCENTAGE OF PERSONS OWNING AND HIRING FARM HOMES.[1]

	1890		1900	
	Owned	Hired	Owned	Hired
Under 25 years.....	32.6	67.4	27.8	72.2
25 to 34 years.....	49.8	50.2	45.3	54.7
35 to 44 years.....	64.0	36.0	64.4	35.6
45 to 54 years.....	72.3	27.7	70.7	29.3
55 years and over....	82.2	17.8	81.4	18.6

This table indicates that nearly three-fourths of the farmers under twenty-five years of age are tenants; that the percentage of tenant farmers declines, and the percentage of landowning farmers increases, as we pass from the younger to the older age periods, until less than a fifth of the farmers who are fifty-five years of age and over are tenants.

Statistics of this kind were first collected in 1890, and while they showed the status at that time and suggested a movement from tenancy to landownership, they did not prove the existence of such a movement. By comparing the figures for 1890 with those for 1900, this movement is

[1] Twelfth Census, Vol. II, p. ccxi.

clearly shown. The occupiers of farm homes, who were from 25 to 34 years of age in 1890, were from 35 to 44 in 1900. By comparing these occupiers at the two dates, we find an increase in the percentage of home owners, from 49.8, in 1890, to 64.4, in 1900. Of the farm-home occupiers belonging to the age period from 35 to 44 in 1890, and to the age period 45 to 54, in 1900, 64 per cent. were owners at the earlier date, and 70.7 per cent. at the latter.

These figures indicate a constant movement from tenancy to landownership. This, however, is a commonplace fact recognized by all who actually observe agrarian movements. This movement is necessary. Young farmers start in with little capital, and through gifts, inheritances, or savings from their profits, they gradually acquire ownership. But, from generation to generation, a smaller percentage of the farmers are able to make this transition. Notice in the above table that of the occupiers of farm homes who were less than 25 years of age, a smaller percentage were owners in 1900 than in 1890. This is true for every age period given in the table except one; the reverse being true for the period from 35 to 44. This suggests that the decline in landownership is due to the inability, or disinclination of the succeeding generation to acquire landownership so generally as their predecessors.

If we wish to know why it is becoming more

and more difficult for a farmer to acquire the ownership of land, we must study those forces and conditions which enable the farmer to buy land, and also the conditions which retard his making investments in land. If we wish to improve the conditions with respect to the ownership of farms, we should devise some means of improving the farmer's facilities for making such acquisitions.

Section II. Land values and landownership.— That progress in society which results in a rise in land values, tends to make it more difficult to buy a farm out of the savings from personal profits. This may be given as an important factor in bringing about the decline in the percentage of landowning farmers. It may be that the farmer will be able to save a larger sum of money each year, and, yet, not be able to pay for a farm so readily after a rise in land values as before; because more money would be required to pay for the land. If the rise in land values kept pace with the rise in the value of farm produce, and no more, so that the profits due to personal ability would rise in the same proportion as land values, the amount of time required for saving the money with which to buy a farm would remain the same. But as a matter of fact the progress which makes a demand for farm products at an increased price is usually accompanied by an increase in the agricultural population, and hence a larger number of farmers would be competing for the use of the

land, so that a larger proportion of the product is credited to the land, and while the efficient farmers may be able to save more money each year than formerly, their savings will not increase so rapidly as will the annual value of the land. More time will be required, therefore, to save the amount necessary to pay for a farm of a given size. Hence, with the progress which brings continually rising land values, a smaller percentage of each generation of farmers will be able to acquire the ownership of land, and this will result in a gradual decline in the percentage of landowning farmers.

A great and unexpected change in prices has a marked influence upon the farmer who is paying off the mortgage on his farm. A rise in prices enables him to pay off the mortgage in a much shorter time than if prices had remained the same as when the debt was contracted. A fall in prices makes it very difficult to pay a debt. The returns from the land fall below the amount that was expected when the debt was contracted and a larger share of the gross returns of the farm is required to pay the interest and a smaller surplus is left, which may be used in paying off the mortgage. When the price of wheat went down, about thirty years ago the price of land in England, and in parts of the United States, went down more than half. Farmers who had purchased land and given mortgages often found their farms worth no

more, and sometimes even less than the face of the mortgage. To pay the interest was a great burden, and many farmers were forced to sell, often for little more than enough to pay the mortgages. Thus it is seen that while the ultimate result of rising prices is to make it harder to acquire landownership, the immediate result may be the opposite, and again, that while cheap land is conducive to landownership, the immediate effect of a lowering of land values is to reduce many landowning farmers, who have encumbered their lands with mortgages as a means of buying land, to the ranks of the tenant class.

In the northern states there seems to be some relation at the present time, between the value of farms and the percentage of tenancy. This relation is shown in the following table which gives the average value per farm (of farm land and improvements, including buildings), and the percentages of tenancy, in the North Atlantic and North Central divisions:

TABLE II. THE VALUE OF FARMS AND THE PERCENTAGE OF TENANCY IN THE NORTHERN DIVISIONS AND STATES, IN 1900.[1]

Geographical Divisions and States	Percentage of Tenancy	Average Value of Farms
North Atlantic.....	20.8	$3,656
New Jersey.....	29.9	4,693
Pennsylvania	26.0	4,006
New York.....	23.9	3,917

[1] Twelfth Census, Vol. V, Tables 5 and 12.

Geographical Divisions and States	Percentage of Tenancy	Average Value of Farms
Rhode Island	20.1	4,206
Vermont	14.5	2,509
Connecticut	12.8	3,615
Massachusetts	9.6	4,190
New Hampshire	7.5	2,391
Maine	4.7	1,627
North Central	27.9	4,354
Illinois	39.3	6,683
Nebraska	36.9	4,746
Kansas	35.2	3,718
Iowa	34.9	6,550
Missouri	30.5	2,962
Indiana	28.6	3,793
Ohio	27.5	3,746
South Dakota	21.8	4,184
Minnesota	17.3	4,329
Michigan	15.9	2,966
Wisconsin	13.5	4,042
North Dakota	8.5	4,385

From the above table it will be seen that, in the North Atlantic division, the state in which the average value of farms is highest is also the state in which the percentage of tenancy is highest, and that the state which shows the lowest farm values, shows, also, the lowest percentage of tenancy. Yet, when the division as a whole is considered, the relation between farm values and the percentage of tenancy becomes very much confused. It is hard to understand why the percentage of tenancy is so low in Massachusetts, for example, where land values are relatively high.

When the North Atlantic division is compared

with the North Central division, the relation between farm values and tenancy seems to sustain the general proposition that a higher percentage of tenancy is generally associated with high land values than with low land values. It is also true that the state with the highest average farm values in the North Central division is the one with the highest percentage of tenancy. When the four states which lie in the heart of the corn belt, Illinois, Iowa, Indiana, and Ohio, are compared, the same relation holds true; but other states such as Missouri and North Dakota seem to throw this relation into confusion. And when the new states, Kansas and Nebraska, are compared with an old state like Massachusetts the influence of the more recent supply of government land in the new states seems to be much more than counterbalanced by some other forces.

By comparing the northern part of Wisconsin with the southern part of that state, the two factors of low land values and recent settlement are brought into comparison with high land values and longer established settlements. While the average percentage of tenancy in the state of Wisconsin seems very low (13.5 per cent.), especially in comparison with that of the state of Illinois (39.3 per cent.), it will be found upon analysis that this low average for the state is due, in a large degree, to the extremely low percentages of tenancy in the northern counties, where there

is much cheap and unoccupied land. There are eighteen counties in the northern part of the state in which the percentage of tenancy is below five. These counties, with their farm values and percentages of tenancy are given in the following table:

TABLE 12. THE RELATION BETWEEN TENANCY AND LAND VALUES IN THE NORTHERN COUNTIES OF WISCONSIN.

Counties.	Number of Farms in the County.	Percentage Operated by Tenants.	Average Value of Farms and Improvements
Burnett.....	1,198	1.1	1,029
Iron.....	83	1.2	1,459
Price.....	885	1.7	1,016
Taylor.....	1,168	1.8	1,345
Shawano.....	3,140	2.2	2,376
Kewaunee.....	2,193	2.4	2,920
Lincoln.....	924	2.4	1,494
Marathon.....	4,376	3.1	1,961
Florence.....	191	3.2	1,202
Marinette.....	1,300	3.5	1,754
Manitowoc.....	4,073	3.8	4,304
Door.....	2,209	4.0	2,231
Oconto.....	2,241	4.0	2,114
Washburn.....	449	4.2	1,169
Ashland.....	489	4.5	1,645
Vilas.....	83	4.8	1,411
Bayfield.....	465	4.9	1,025
Oneida.....	350	4.9	1,112

While the percentage of tenancy is low in the northern part of Wisconsin it is relatively high in the southern part. The fourteen counties which showed the highest percentage of tenancy, in 1900, form a solid block in the southern part of

the state. These counties are given in the following table:

TABLE 13. TENANCY AND LAND VALUES IN THE SOUTHERN COUNTIES OF WISCONSIN.

Counties	Number of Farms in County	Percentage Operated by Tenants	Average Value of Farms and Improvements
Rock.....	3,829	35.4	6,769
Milwaukee...	2,576	31.2	10,342
Walworth....	2,754	29.7	7,703
Kenosha.....	1,298	29.1	7,387
Lafayette.....	2,501	27.6	6,610
Green.....	2,540	26.4	6,589
Dane.....	6,346	26.2	6,125
Racine.....	2,118	24.8	6,478
Columbia.....	3,439	24.0	5,208
Grant.....	4,219	20.7	5,106
Waukeshaw..	3,549	20.0	6,595
Iowa.....	2,547	18.9	5,319
Jefferson.....	3,453	18.2	6,365
Dodge.....	4,994	18.1	7,313

These tables show clearly that, in general, the percentage of tenancy is high, in the state of Wisconsin, in the districts which have been longest settled and where land values are relatively high. And yet, there are here, as in the other comparisons, many exceptions to the general rule; and this makes it necessary to emphasize the fact that many forces are operating together in bringing about the condition with respect to landownership and tenancy.

Section III. Landownership and tenancy among the negroes.—In the southern states where the percentage of tenancy is high, in comparison

with that of the northern states, the value of land is relatively low. Other factors have evidently had more to do in determining the situation here than the influence of land values. The average value of farms is $4,354 in the North Central division, while it is only $1,628 in the South Central division, whereas the percentage of tenancy is 48.6 in the latter and only 27.9 in the former division. The negro seems to be an important factor in the problem of tenancy and landownership in the southern states. In the following table is given the percentage of all farms, which are occupied by tenants; the percentage of all farms operated by white farmers, which are occupied by tenants; the percentage of all farms operated by negro farmers, which are operated by tenants; and the average value per farm of all farm land and improvements:

TABLE 14. TENANCY AND LAND VALUES IN THE SOUTHERN STATES.[1]

Divisions and States	Percentage of all Farms which are operated by Tenants	Percentage of Farms operated by White Farmers, which are rented	Percentage of Farms operated by Negro Farmers, which are rented	Average value of all Farms
South Central..	48.6	37.8	77.4	$1,250
South Atlantic.	44.3	33.1	70.2	1,254
Georgia.....	59.9	44.8	86.0	815
Alabama.....	57.7	37.9	84.9	603
Mississippi.....	62.4	32.9	83.6	688
Louisiana.....	57.9	32.1	83.8	1,217

[1] Twelfth Census, Vol. V, Tables 5, 6 and 7.

From the above table it will be seen that the situation in the South can be explained, in part at least, in terms of the negro population. It is relatively a short time since the freedmen started with nothing, and the fact that a small percentage of them, even, now own the land which they cultivate is in itself an encouraging fact. In the South Central division 26.8 per cent. of all farms are operated by negroes, and while the percentage of tenancy for all farmers in this division is 48.6 that for the negro farmers is 78.5. In Alabama, where 42.1 per cent. of the farms are operated by negroes, the percentage of tenancy for all farms was 57.7, while that among negro farmers was 84.9 and that among white farmers was 37.9. In Mississippi, where 62.4 per cent. of all farms were operated by tenants, 83.6 of the negro farmers were tenants, while only 32.9 per cent. of the white farmers were tenants.

In Adams county, Mississippi, where 92.4 of all farmers are negroes, the percentage of tenancy is 87.9, whereas in Hancock county, where 91.7 of all farmers are whites, only 8.5 per cent. of the farms are operated by tenants. Again, Issaquena county, where 95.7 per cent. of all farmers are negroes, 90.3 of all farms are operated by tenants. This is sufficient to illustrate the general principle that where the negro farmers are very numerous the percentage of tenancy runs higher than where the white population dominates. Both the white

and the negro farmers are more commonly tenants where the negroes are most numerous. In the states bordering on the black belt the percentage of tenancy among the negroes is relatively high.

The present situation with respect to tenancy and landownership among the negro farmers, is described in a recent census bulletin in the following terms:[1] "Present conditions in the farm life of the southern negro can be understood only by bringing to mind the historic development. Before the war the southern plantation consisted of the owner, from 20 to 200 slaves, and several hundred acres of land. . . . One of the most striking features in connection with plantations such as these is their large area. . . . Between 1850 and 1860 the average size of the plantations in the cotton growing South increased from 427 to 431 acres; leaving out Texas, whose ranches in 1850 were not really farms, the increase was from 353 to 408 acres, or 15.7 per cent."

"The situation of the farming population in the black belt to-day shows four well defined economic classes. There is the farm laborer who receives for his work, at the end of the year, certain fixed wages, varying from $30 to $60. Some receive also a house, perhaps with a garden spot, and have their supplies of food and clothing advanced; in such cases the supplies must be paid

[1] Negroes in the United States, Bulletin 8, Bureau of the Census, pp. 78 to 82.

for, with interest, out of the money wages. Another class of laborers are contract hands—*i. e.*, laborers paid by the month or year and fed and supplied by the landowner. Such laborers receive from 30 to 40 cents per day during the working season; they are usually unmarried persons, many being women, and when they marry they become metayers, or occasionally, renters.

"The cropper is entirely without capital, even in the limited sense of food or money to keep him from seed time to harvest; all he furnishes is labor, while the landowner furnishes house, land, stock, tools, and seed. At the end of the year the cropper gets a stipulated portion of the crop; out of his share, however, comes payment, with interest, for food and clothing advanced him during the year. Thus we have a laborer without capital and without wages, and an employer whose capital consists largely of food and other supplies advanced to laborers — an arrangement unsatisfactory to both parties, and in vogue usually on poor land with hard pressed owners.

"Above the cropper comes the share tenant who works the land on his own responsibility, paying rent in cotton, and supported by the crop lien system. The great mass of the negro population is found in this class. After the war this plan attracted the freedmen on account of its larger freedom and its possibility for making a surplus. If the rent fixed was reasonable, this was an incen-

tive to the tenant to strive; on the other hand, if the rent was too high or if the land deteriorated, the result was to discourage and to check the efforts of the tenant.

"The renter for a fixed money rental belongs in the highest of the emerging classes. The advantages possessed by this class are their freedom to choose their crops and the increased responsibility which comes through having money transactions. While some of the renters differ little in condition from the metayers, yet on the whole, they are a more intelligent and responsible class and are the ones who eventually become landowners."

As to the distribution of the landowning negro farmers and the conditions which have been conducive to the acquiring of landownership on the part of the freedmen the following may be quoted from the same source as the above: "In the states along the northern border of the South, ... the per cent. of owned farms among negro farmers is comparatively high, varying from 40.5 in Delaware to 72 per cent. in West Virginia. In Georgia, Alabama, Mississippi, and Louisiana the percentage is very low, ranging from 13.7 per cent. in Georgia, to 16.3 per cent. in Mississippi; in South Carolina the percentage is somewhat higher (22.2) but is still below the average for the country. These five states are in the heart of the South; they comprise the greater part of the black belt; in each of them negroes form between

45 and 60 per cent. of the total population, and negro farmers between 35 and 60 per cent. of all farmers. Collectively they contain almost one-half (47.5) of the total negro population of the United States."

"In states where negroes are relatively less numerous the percentage of ownership is higher. This suggests the inference that where the negroes are massed, tenancy is the prevailing form of farm tenure; but it is not so clear that we have here a direct relation of cause and effect. These states are all cotton growing states. The massing of negroes, tenant farming and cotton culture appear to be correlated facts, the first resulting from the last, and the second and the last acting as reciprocal cause and effect to the crop lien system. In Florida, which has a percentage of negro population (43.7) almost as high as that of Georgia (46.7) the percentage of ownership among colored farmers is high (48.4) because of the greater ease of acquiring fertile land in a newly settled state. For the same reason, in Texas, where nine-tenths of the negro farmers make cotton their principal crop, the percentage of ownership (30.7) though not high, is above the average for the country."

In South Carolina the government lands were sold on favorable terms. In North Carolina there was a thrifty free negro element. Virginia "had developed slavery furthest and brought a

larger body of negroes to a considerable degree of culture and civilization before 1861 than had any other state. It also bore the main brunt of the war, and the breaking up of estates gave the negroes a chance to buy." Hence it will be seen that such considerations as government lands, efficiency of the farmers, etc., are important factors in determining the percentage of tenancy among the negroes as well as among the white farmers.

Section IV. The Ownership of rented farms. —The ownership of these rented farms is not concentrated in the hands of a few wealthy persons as is the case in England, but is widely distributed. In collecting the data for the Census of 1900, an attempt was made to ascertain the names and residence of the owners of rented farms. As a result of this inquiry, the residence of the owners of 95.6 per cent. of all farms in the United States (exclusive of Alaska and Hawaii) were reported.

"Of the 1,934,346 farms in the United States for which the names and post-office addresses of the owners were reported, the owners of 1,523,-863, or 78.8 per cent. resided in the same county in which their farms were located; 307,656, or 15.9 per cent., in the same state but not in the same county; 102,827, or 5.3 per cent., outside of the state; [and 1,097, or .051 per cent., in foreign countries]. Many residing in the same state, but

not in the same county, had homes very near their rented farms. This was notably the case with farms located near county lines. Such owners can hardly be classed as non-residents, and the very small per cent. of rented farms owned by non-resident landlords would have been still further reduced if it had been practicable to exclude such owners.

"The Western division had the smallest proportion of rented farms whose owners resided in the county where their rented farms were located. . . . . The South Central and South Atlantic divisions had the largest proportion of owners residing in the county where their rented farms were located. . . . The North Central division had the largest, and the Western the next largest, proportion of rented farms with owners residing outside of the state."[1]

Eighty per cent. of the owners of rented farms in the United States owned but one rented farm each, and fifty-two per cent of the rented farms were owned by persons who owned but one rented farm. The situation in this regard is made clear by the following tables, which show the per cent. of the number of rented farms and of the number of owners of rented farms classified by the number of farms owned by one person:[2]

[1] Twelfth Census of the United States, 1900, Vol. V, p. lxxxvii.
[2] *Ibid.*, p. lxxxviii.

PER CENT. OF THE NUMBER OF RENTED FARMS CLASSIFIED BY NUMBER OF FARMS OWNED BY ONE PERSON

Geographic Divisions and Foreign Countries	1 Farm	2 Farms	3 and under 5 Farms	5 and under 10 Farms	10 and under 20 Farms	20 Farms and over
The United States	52.0	14.8	11.6	9.7	6.0	5.9
North Atlantic...	82.0	9.7	3.6	2.2	1.0	1.5
North Central....	73.7	13.7	6.9	3.7	1.2	0.8
South Atlantic ...	39.3	17.4	16.1	14.3	7.8	5.1
South Central	35.8	15.4	14.5	13.4	9.7	11.2
Western	76.6	10.0	5.3	3.7	2.3	2.1
Alaska and Hawaii	91.7	5.0	3.3			
Foreign Countries	63.7	8.7	7.7	4.3	7.7	7.9

PERCENTAGE OF THE NUMBER OF OWNERS OF RENTED FARMS CLASSIFIED BY NUMBER OF FARMS OWNED BY ONE PERSON

Geographic Divisions and Foreign Countries	1 Farm	2 Farms	3 and under 5 Farms	5 and under 10 Farms	10 and under 20 Farms	20 Farms and over
The United States	80.0	11.4	5.4	2.3	0.7	0.2
North Atlantic...	92.8	5.5	1.3	0.3	0 1	0.0
North Central....	88.4	8.2	2.6	0.7	0.1	0.0
South Atlantic ...	70.4	15.5	8.6	4.1	1.1	0.3
South Central	70.3	15.1	8.6	3.9	1.5	0.6
Western	91.1	5.9	1.9	0.8	0.2	0.1
Alaska and Hawaii	96.5	2.6	0.9			
Foreign Countries	88.6	6.1	3.0	1.0	0.9	0.4

It will be noted that the ownership of rented farms is more concentrated in the southern states than in other parts of the United States. This is explained in the census report as follows: "Originally, great areas of land in the South were held in large plantations and operated by slave labor. After emancipation that form of labor was super-

seded by some form of contract leasehold, by which the former slaves or wage laborers were given charge of . . . . small tracts of land, upon which they were to raise crops."

Thus we find that while more than a third of the farmers of the United States hire the land which they cultivate, these hired farms are so generally held by men who live near by, that the relation of landlord and tenant is generally a personal one, and the problems of absenteeism and of concentration of ownership which have been so perplexing in certain other countries have as yet been of little significance in the United States. Nevertheless the statistics for the last twenty years show a significant increase in tenancy, and it is to be expected that the men who have made fortunes in the great industries of the cities will eventually invest some of their savings in landed estates, and in this way bring forward problems from which we have hitherto been comparatively free.

Section V. The relations between landlords and tenants in the United States.—Thirty-five and three-tenths per cent. of all the farms in the United States, exclusive of Alaska and the insular possessions, were occupied by tenant farmers in 1900. In all 2,024,964 farms were operated by this class of farmers. Of these, 1,273,299 or 62.8 per cent. were operated by share tenants and 751,665 or 37.2 per cent. by cash tenants. A farm was said to be operated by a cash tenant if culti-

vated by a tenant who paid "a fixed rental in money, or a stated amount of labor or farm commodities," and by a share tenant if operated by a tenant who paid "for its use a share (as one-third, or one-half or other proportion) of crops raised."[1]

Share tenancy.—Share tenancy is preferred by many tenant farmers because the risk is less. The thought of paying a fixed rent whether the crop is large or small and whether the prices are high or low is not attractive to the majority. And again, many of the tenants do not possess sufficient wealth to enable them to own all of the stock necessary to operate a farm on a cash basis.

The landlords who live in close proximity to the land which they let, and who have time to devote to its supervision, usually prefer a share of the crop because they find it more profitable to them. The share system is more profitable to the landlords largely because of the close supervision which they give to the farms let on shares. Many of the tenants are young and inexperienced, and are willing to leave the general management of the farm to the landlord, who is very likely to be an elderly farmer, and the fact that he has a farm to let suggests that he has been a successful farmer. All tenants are not so willing to be directed by their landlords, but if they pay a share of the products as rent the landlord's right to give advice is apparent, whereas, if cash is paid there

[1] Twelfth Census, Vol. V, p. 759.

seems to be no good reason why the tenant should not do as he likes. The principle being established that the landlord has a right to direct more or less definitely the operations of the farm, as in the case of share tenancy, the landlord has little difficulty in so directing the management of the farm as to preserve the fertility of the land. The choice of crops, and the organization of the field-system are subjects which the share tenant is usually willing to leave to the landlord, and in many cases the landlord controls the field operations in the minutest detail. For example, the depth to which land is to be plowed, the time of sowing, planting, harvesting, etc.; the number of times a field of Indian corn should be cultivated, etc., are details to which the landlord often gives his attention under this system of letting land. The landlord is willing to exert himself for these purposes because his profits are increased by such activity.

Another reason often given by landlords for preferring a share of the crop to a cash rent, is that, in a country where most of the tenants have little wealth, a share of the product proves more profitable to the landlord, in the long run, because he shares the benefit of an extra large crop and gets something out of the smallest one, whereas in case he is receiving a fixed rent, the tenant gets all the advantage of an extra large crop, but in case of a crop failure the tenant is often unable to pay the fixed rent and the landlord has to stand

the losses when the crops are short without getting the advantage of the extra large crops. Where the tenants are men of considerable wealth this is a matter of less importance.

Again, it is said that the collection of the rent is an easier matter where a share of the crop is given. "Farmers will give a fifty cent chicken for a church dinner when they would not think of giving as much as twenty-five cents in cash," says an Iowa farmer who has tried both systems, and he continues, "They will give the landlord his share of the farm products much more cheerfully than pay him cash."

The share rent adjusts itself to changes in the value of the products without any change in the contract. This is looked upon by some farmers and landlords as a reason of first importance for adhering to the share system.

Participation of the landlord in the management of the farm, is the chief reason for the success of share tenancy in this country. This point has been emphasized over and over again in the communications received from men who are in a position to know. Share tenancy is, as a rule, more profitable to the landlord only when the farm is under his immediate supervision. If the management must be left entirely to the tenant farmer the cash system is usually preferable to the landlord. If the tenant is a capable manager, so that the supervision of the landlord adds nothing to

the product, then it is better for the tenant to pay a fixed rent and secure the extra profits due to his superior ability.

The methods of letting land for a share of the products are so very numerous that to describe all the forms of share tenancy is practically impossible. In this connection we shall attempt no more, therefore, than to outline briefly some of the methods in common use in the North Central states.

Perhaps the simplest form of share tenancy arises where one farmer has more land than he cares to cultivate while some of his neighbors have less than they wish to cultivate. This leads to a form of share tenancy in which persons living on their own farms and in their own houses simply enter the fields of the landlord to grow a crop of grain or to make hay on shares. The usual method is for the tenants to furnish seed, teams, tools and machinery. In some cases the bill for binding twine and the threshing bill are paid entirely by the tenant and sometimes these bills are divided between landlord and tenant in the same proportion in which the grain is shared. The landlord's share of the crop varies in different parts of the country from one-third to one-half of the grain, to be put into the landlord's bin or delivered at the market. When meadows are let in this way one-half or more of the hay is delivered to the landlord in the mow or in the stack.

Under this system, the landlord has absolute control of the kinds of crops to be grown and of the system of crop rotation. The land is usually let for but one year. A serious objection to this system of letting land is the fact that a large share of the product is taken from the land and sold or fed out on another man's land.

The share system becomes somewhat more complex when the landlord furnishes a house and barn and garden-patch for the tenant. If the tenant desires to keep but little live stock, let us say a team, a cow, a few hogs, and some poultry, his living upon the place will not make a great difference in the system; but if he desires to keep sufficient live stock to consume his share of the crop, and especially if he wishes to keep cattle, the system becomes more complicated. The tenant's demand for pasture land is often met by leasing to him for a cash rent, a certain amount of land to be used for grazing purposes. The feeding of the crop on the farm is an important advantage of this method of letting land. In tenancies of this description, the contracts are most commonly drawn for but one year with the understanding that a satisfactory tenant may renew his contract indefinitely.[1]

In the United States, tenant farmers are largely young men, however, who do not as a class possess a great amount of wealth which can be in-

[1] See Appendix A at the end of this chapter.

vested in live stock. In the dairy districts, especially, it is common, therefore, for the landlord to furnish a part of the live stock. In some instances the landlord furnishes a given number of cows, and other kinds of live stock, while the tenant furnishes the horses (the number to be kept being limited by the contract), the tools, machinery, etc., necessary to operate the farm.[1] In other instances the "stock and land" lease is so arranged that the landlord and the tenant each owns a half interest in all of the live stock, tools, machinery, etc., necessary to operate the farm. The tools and machinery are sometimes furnished by the tenant, and in other cases each party owns a half interest in them, in fact there exists the greatest variety of arrangements between landlords and tenants.[2] The management of the farming operations is usually under the close supervision of the landlord. The product is usually shared equally by landlord and tenant. This form of tenancy is essentially a partnership in which the labor is balanced against the land.

The landlords are usually unwilling to enter into an agreement to let land on this plan for more than one year, unless they know the tenant. On the other hand, it is well understood by both parties that it would be unprofitable to enter into a partnership of this kind for but one year. It is

[1] See Appendix B at the end of this chapter.
[2] See Appendix C at the end of this chapter.

common, therefore, where the landlord and the tenant are acquainted with each other, for tenancies of this kind to be entered upon for three, or five year periods, with the understanding that the tenant is to remain for a much longer period if satisfactory to both parties.

Where land is let for a share of the crop there are so many details which must be agreed upon by both parties, that troublesome differences of opinion are likely to arise. It is quite generally agreed among those concerned, however, that where difficulties arise between landlords and tenants, it is usually due to the fact that one or both of the parties is too grasping. A grasping landlord drives the tenant to use dishonest means in order to make both ends meet. The landlord who is willing to give his tenants a fair chance, and then insists on good farming and honest business, and discharges every tenant at once who is very inefficient and not strictly honest, will have little trouble with his tenants.

Time and again, landlords have said to the writer that if both parties would observe the golden rule there would be no occasion for trouble between landlords and tenants. There is occasion, very often, for the use of the golden rule in the relations between the share tenant and his landlord. This is true because of the close relations into which they are thrown in the management of the farm. The landlord may think that a

certain field of Indian corn should be cultivated one time more than the tenant cares to cultivate it. The tenant may figure that his share of the additions to the crop due to the extra cultivation, will not remunerate him for the extra effort. In a case of this kind, however, the fair minded tenant should be willing to give as many cultivations to the crop as he would if he owned the land, and this is all a fair minded landlord should ask.

Cash tenancy.[1]—Cash tenancy is usually considered by economists as a step in advance of share tenancy. "This method of putting out lands to farm," says Turgot,[2] a French writer, whose work was published in 1770, "is the most advantageous of all, both to the proprietors and to the cultivators; it establishes itself everywhere where there are rich cultivators in a position to make the advances of the cultivation; and as rich cultivators can provide the land with much more labor and manure there results from it a prodigious increase in the produce and revenue of estates. In Picardy, Normandy, the neighborhood of Paris, and in most of the provinces of the North of France, the lands are cultivated by cash tenants. In the provinces of the South they are cultivated by share tenants; the provinces of the North of

[1] See Appendix D at the end of this chapter for copy of a Wisconsin cash lease.

[2] Reflections on the Formation and the Distribution of Riches (Economic Classics, edited by W. J. Ashley), p. 24.

France are likewise incomparably richer and better cultivated than those of the South."

While only a little more than a third of the tenant farmers of the United States pay a cash rent, this form of tenancy has been increasing more rapidly in recent years than has share tenancy. In 1880, 31.1 per cent. of farms operated by tenants were operated by cash tenants; in 1890, 35.1 per cent.; and in 1900, 37.2 of all such farms were let for a cash rent.

Landlords who live too far from their land, or are too busy, to give it the needed supervision for making share tenancy a success, usually prefer to let their farms for a cash rent. It is claimed by many landlords that the tenants devote much greater care to their farming under the cash system of letting land. The feeling that every extra bushel of grain and every extra fork of hay is all his own will naturally make the tenant more painstaking than he would be if only a part of these products were to be added to his own profits.

This desire to obtain as large a return as possible is, at the same time, the greatest source of trouble in adjusting the relations between landlords and tenants. The tenant who has a contract for but one year is inclined to look too strictly to securing as large a profit as possible for that one year without any regard to the future. As a result of this short-sighted economy, too

large a proportion of the land is often devoted to exhausting crops and the larger profit of the one year is obtained at the expense of the profits of future years. The cash tenant sacrifices the long-time-average returns in order that his net profit for the one year may be increased.

By proper regulations with respect to the proportion of the land which shall be devoted to certain crops, this difficulty can be more or less successfully overcome, but such regulations are always annoying to the tenants. The granting of a lease for several years is thought by many to be all that is necessary to meet the difficulties arising from the short-sightedness of the tenants, but many landlords object to making a contract for a period of any great length. With all the difficulties which may beset this system, cash tenancy is preferable to share tenancy wherever the management of the farm is to be left almost entirely to the tenant, and where agriculture is extensive and where the use of commercial fertilizers is unknown the letting of land for cash is a fairly successful method.

Where intensive culture and the use of commercial fertilizers have become necessary the tenant problem takes on a more acute form. If we would study to advantage the problems which arise under these conditions, we must turn our attention to an older country than our own, where the tenant problem has been a more serious one,

and whence we may learn from the experience of others the remedies which are fast becoming necessary to good relations between landlords and tenants in this country. The further discussion of the tenant problem will be deferred, therefore, until the next chapter in which the experience of the English in adjusting the relations between landlords and tenants will be taken up.

APPENDIXES TO CHAPTER XII

APPENDIX A

LEASE USED IN LETTING THE FARMS OF THE ESTATE OF HIRAM SIBLEY, F. A. WARNER, MANAGER.

There are more than one hundred leased farms belonging to the Estate of Hiram Sibley, Sibley, Illinois. Mr. F. A. Warner has the reputation of being an unusually successful manager of landed estates, and we are very glad, for this reason, to be able, through his courtesy, to include a copy of the lease which he uses.

Farm No.....

THIS INDENTURE, Made and entered into this first day of March, A. D., 190.., between the executors of the Estate of Hiram Sibley, parties of the first part, and..... .....party of the second part: *Witnesseth,* That the parties of the first part have this day demised, leased and to farm let, and by these presents do demise, lease and to farm let to the party of the second part the following described land, situated in the County of Ford, and State of Illinois:

1. Description of land. The .....quarter of section..... in Town.....North Range..... east of the Third Principal Meridian.

2. *Period of lease.* *To Have and to Hold* the same to said party of the second part for one year, commencing on the first day of March, 190.., for and during and until the first day of March, 190.....

3. *Rent share of crops.* And the party of the second part covenants with the parties of the first part to pay as rent for said premises two-fifths (2-5) part of the corn, two-fifths (2-5) part of the oats and other small grain and one-half (½) part of all kinds of straw raised or grown upon said premises.

4. *Labor, etc., by tenant.* The said party of the second part agrees to furnish all necessary teams, implements, seed and labor to properly prepare and cultivate said land, and all crops thereon, in extra good and farmer-like manner; to put in said crops in good order as early as the season will admit, to harvest said crops as soon as they are sufficiently matured, and to promptly deliver the rent share thereof to said party of the first part in such manner and at such times as hereinafter specified.

5. *Acreage and kind of crops.* The party of the second part hereby covenants to farm.....acres in corn, ...acres in oats,.....acres in pasture and lots, and further agrees to sow .....acres of the oats land in red clover, each party to furnish one-half (½) the clover seed.

6. *Planting and cultivation of corn.* Corn to be planted in check rows on land to be prepared as party of the first part may direct, and to be cultivated at least three times, twice the way the corn was planted and once crosswise, during proper season.

7. Manner and time of delivery of rent corn.

The said party of the second part hereby covenants and agrees that he will deliver the rent share of the corn, as stated above, to said party of the first part, in crib at Sibley Station, Ford County, Illinois, clean husked and in good condition, and before any other share, part or portion of said crop shall have been gathered, and to complete delivery of said rent portion before the first day of January, 190.., and to remove from the fields the remainder of said corn crop before the first day of February, 190.., and that he, the said party of the second part, shall divide said crop of corn by the rows as standing in the field in a just, fair and equitable manner. Sixteen (16) rows for rent share and twenty-four (24) rows for tenant's share. The counting and laying out of the rent rows and the tenant's rows shall be done before the fifteenth day of October, 190.., and the tenant's rows shall be marked by cutting out four (4) or more hills of each row on one end of the tenant's share.

8. Harvesting and delivery of seed small grain, straw.

The said party of the second part agrees to properly stack on said premises all small grain as soon as sufficiently dry after being cut, and at his own expense to thresh the same before the first day of October, 190.., and to divide said oats at the threshing machine, using tallies furnished by party of the first part, and to deliver the rent portion to said party of the first part, at Sibley, Illinois, and to properly stack the rent share of the straw as it comes from the threshing machine. Also to stack in good manner on said

premises, as directed, the rent portion of hay grown thereon.

9. *Ditches to be cleaned.* All open ditches to be cleaned out by the party of the second part, with team and scraper, when directed by said first party. All willows or other trees or shrubs growing in open ditches to be dug out by the party of the second part. All tile outlets to be kept open and in repair by said second party.

10. *Weeds in highways to be mowed.* The said party of the second part to mow all weeds on highways adjoining said premises, to the center of the traveled road, during the first ten days of the month of September, 190.., such mowing to be done upon that side of said highways as adjoins said land.

11. *First party may plow stubble ground.* Said party of the first part also reserves the privilege of plowing the stubble or stalk ground on said premises when said party of the second part may have secured the crops or grain grown thereon, and may enter on said premises at any time for purposes of improvement, or for any

12. *Right of entry reserved.* reasonable purpose which said party of the first part may deem proper; and unless otherwise agreed in a written contract, the use of the stalk and stubble ground shall belong to and be vested in the said first parties, or be at their disposal as they may deem most advantageous to their interests.

13. *Meadows and pastures not to be plowed.* And further it is agreed, that no meadows or pastures shall be plowed or broken up during the term of this lease without the written consent of said first parties.

The said party of the second part agrees to keep said premises free from

14. Burrs and weeds to be destroyed, hedges, etc., kept clear, manure to be spread, etc., delivery of possession without notice.

burrs, Canada thistles, bull nettles, burdock and other noxious weeds by pulling out and destroying all such weeds before the 20th day of August, 190.., to properly cut or trim during August and September the hedges belonging to said land, and pile and burn all brush resulting therefrom, to keep clear of weeds and trash all hedges, turn rows and ditches on the said land; to spread when and where directed all manure that may accumulate on said premises; to keep in good repair all fences and outbuildings on said premises; to properly care for all hedges, trees and shrubbery of all kinds; and to deliver the free and full possession of said premises (with fences, buildings and other appurtenances therewith belonging, in as good condition as when received, except the natural wear from careful usage and the elements) to said parties of the first part, their successors or assigns, on the first day of March, A. D., 190.., without any further demand or notice.

15. Not to sublet.

It is especially covenanted and agreed that the said party of the second part shall not sub-let said premises or any part thereof, without the written consent of the parties of the first part.

16. Stock confined.

The party of the second part also covenants that no live stock of any character shall be permitted to run at large on said premises, nor to be turned into said premises, except within a properly enclosed pasture, and said party of the second part further agrees to pay in cash, on or before September 1st, 190.., to said parties of the first part the sum of

17. Pasture rent. four dollars ($4.00) per acre for inclosed pasture and for all parts of said premises from which the stipulated share rent is not received, and land sown to clover and remaining in clover second year the sum of two and fifty one-hundredths dollars ($2.50) per acre for first year, and said land to be used for hay and seed only. Each succeeding year the rent to be same as pasture land.

All cash payments of rent to draw interest at the rate of seven per cent. per annum after the date when due until paid.

18. Material to be hauled. All materials for improvements of any kind to be hauled at the expense of second party, and no claim for labor or for materials will be recognized by first parties, excepting as agreed in writing to be endorsed on this lease.

It is understood and agreed that no buildings or sheds of any kind shall be attached to buildings belonging to parties of the first part without the consent of said first parties.

19. Lien for rent. The party of the second part covenants and agrees that the parties of the first part shall have a first lien and claim on all the products of said land, during said term, to secure the payment of said rent, and the taking or giving of any notes or other security for said rent shall in no wise affect said lien, but shall be taken and considered as additional security to said landlord's lien.

And it is further understood and agreed that if party of the second part shall abandon said premises, or shall fail from any cause to comply with all his agree-

20. *Premises to revert to first party in case of abandonment.*

ments herein, the said parties of the first part may at any time, when such abandonment or failure occurs, take actual possession of said premises and buildings thereon, which said party of the second part agrees to surrender, and said first parties may employ other persons to tend said crop and harvest or gather the same, and may remove and sell the same at public or private sale and apply the proceeds thereof to the expense and cost of carrying out the provisions of this lease and the payment of said rent hereby reserved, and all advances, and if the proceeds of the crops as aforesaid shall not be sufficient to repay said first parties all the money so expended, the said party of the second part agrees to refund to said parties of the first part such deficiency on demand out of any other property belonging to the said second party.

21. *First party may terminate lease by default.*

And it is further expressly agreed between the parties hereto, that if any default shall be made of any of the covenants and agreements herein contained to be kept by party of the second part, this lease shall at the election of the parties of the first part be null and void.

22. *Superintendence of farm work.*

And it is further understood and agreed that all the farm work on said premises during said term shall be under the direction and supervision of the parties of the first part, their agent or superintendent,

.....

The cost of all seed or grain for feed furnished by first parties is to be considered as advances, and added to the rent herein reserved.

All the foregoing covenants and agree-

23. Consideration. ments on the part of said party of the second part, form the consideration of this lease, and together constitute the rent herein reserved.

Witness the hands and seals of the parties aforesaid the day and year first above written.

APPENDIX B.

COVENANTS FOUND IN WISCONSIN LEASES WHERE LIVE STOCK IS LET WITH THE LAND.

After describing the land, giving the time of entry which is sometimes October 1, sometimes March 1, and sometimes April 1, and the term for which the lease is drawn, which varies from one to five years, the following covenants are inserted:

The landlord agrees to furnish for the use of said farm during said lease, from twenty-five to thirty cows, one bull, eight head of brood sows, one boar, all grass seed that is required and one-half of all feed for said stock.

The tenant agrees to do all the work required to operate said farm in a workmanlike manner.

Also to put in such crops as shall be mutually agreed upon.

Also to haul out and distribute upon said farm, at places most needed, all manure made thereon, and at such times and at such places as shall be designated by the landlord.

The tenant agrees also, to work the highway taxes assessed on said farm and property for the year 190..

The tenant further agrees to furnish the teams and all farming utensils necessary to work said farm in the best possible manner. (It is common where the horses thus furnished by the tenant, are fed out of the common stores of feed, to limit the number of horses that can be kept, and if the number be increased beyond this limit to charge the tenant for the feed thus used.)

Also one-half of all the feed necessary to feed the stock heretofore described.

Also to milk said cows and to take proper care of all of said stock.

The milk from said cows is to be delivered free of charge by said tenant to such creamery or cheese factory as shall be for the best interest of both parties, and the money derived therefrom is to be equally divided between the landlord and the tenant.

All feed of every description raised on said farm during the term of this lease is to be fed out upon said farm if it can be fed profitably, except in case any wheat is raised thereon, the same to be equally divided after threshing, each party to have one-half, and the half belonging to the landlord is to be stored by the tenant in the granary situated on said farm.

It is agreed that all grain, feed and repairs necessary for the use of said farm and stock is to be hauled by the tenant free of charge.

It is mutually agreed that one-half of the bills for binding twine and for threshing shall be paid by each party to this contract.

The tenant is to do all the work in putting up necessary fences on said farm, the landlord to furnish the materials.

The tenant further agrees to take all necessary steps to prevent any washouts on said farm, by using proper care in plowing and to seed such places as are likely to be washed out.

It is further agreed by and between said parties that all the hay, corn fodder, straw, and other rough feed raised upon said farm and *not* fed out at the expiration of this compact is to be the property of the landlord.

Also that all grain raised upon said farm that can be profitably fed to the stock shall be so fed and the surplus, if any remain at the expiration of this contract, is to be equally divided between said parties.

Also that the increase from said stock shall be sold at such time or times as shall be deemed to the best interests of both parties and the proceeds equally divided.

Also that when stock or grain is sold it is to be delivered on the market by the tenant.

It is agreed that the tenant is to have the exclusive use of one cow. Also one acre of ground for garden purposes.

At the expiration of this contract said tenant agrees to deliver peaceable possession of said farm together with the stock described herein to said party of the first part.

In witness whereof, etc.

APPENDIX C

Covenants Found in a Combined Lease and Partnership Used in Wisconsin

This indenture made this ..... day of March, 190.., between .... of the city of ....., county of ....., state of ....., party of the first part and .... of said city, county, and state party of the second part.

WITNESSETH that ...., party of the first part, agrees to rent his farm, etc. [Here follows the description of the farm which consists of ..... acres of arable land and ..... acres of pasture land], to .... party of the second part.

It is agreed between these contracting parties, that they are to buy and own all personal property that is needed and used in conducting operations on this farm and share alike equally all profits and losses resulting from same.

It is agreed that the said party of the second part is to perform or pay for the performance of all labor used in conducting operations on said farm except it be for the repairing or painting of buildings which the party of the first part must be holden for unless they be minor repairs.

Also that said party of the second part is to build and keep in good repair all fences on said farm and all material used for same to be furnished by party of first part at his own expense.

Also all grass seeds are to be furnished by party of the first part.

Also that said party of the second part is to work or pay the road tax, party of the first part is to pay all taxes on realty, and the taxes on personal property to be paid jointly.

Also the bill for threshing grain or seeds, for binder twine, harness repairs, blacksmith work and veterinary hire to be paid jointly.

It is agreed also that all ditches forming on the land are to be properly filled at the proper time by the party of the second part.

Also that all noxious weeds, including bull thistles to be cut at the proper time and the weeds of any description on the highways adjoining the above described land to be cut to the middle of the road by party of the second part.

Also all flood wood and debris lodging along the banks of the creek from freshets to be removed by party of the second part. All brush and debris in the grove on said farm to be kept gathered up and burned by party of the second part. All dead trees in said grove to be used by party of the second part for fire wood, if he wants the same, also all refuse from buildings and fences not fit for use again.

Also all brush and weeds of any description, growing in fence corners on said farm to be kept cut by party of the second part.

It is further agreed that no stock shall be allowed in the pastures or meadows while the frost is leaving the ground or until the ground is fairly settled.

It is also agreed that the party of the first part is to have the use of teams for his private use at any time he wishes when they are not in use on the farm, party of the second part to have the same privilege.

Also that no grain or feed is to be sold off the above farm without the consent of both parties to this contract.

Also that the said lease of the above described land is to run from March ... 190.., for the term of ..... years, and at the termination of said lease, should a dissolution be agreed upon, all personal property to be equally divided between said parties. [There are various methods used in dividing the property at the termination of a partnership of this kind. One method is to have the property appraised by disinterested parties and then retained by the one or the other party as the case may be, who pays to the other party

one-half the appraised value of all such property. Another method is to put the property up at public sale and divide the proceeds equally between the contracting parties. Still another method is to have the tenant divide all of the live stock of each kind and all of the other personal property which is held in common, into two lots and then the landlord takes his choice of the lots.]

APPENDIX D

A Wisconsin Cash Lease

This Indenture, made and entered into this ..... day of March, 190.., by and between ...., of the city of ....., county of ..... and state of Wisconsin, party of the first part and ...., of the county and state aforesaid, party of the second part,

Witnesseth: that the said party of the first part, for and in consideration of the rents, covenants and agreements hereinafter mentioned, reserved and contained, on the part and behalf of the party of the second part, their heirs, executors, administrators and assigns, to be paid, kept and performed, hath demised and to farm let, and by these presents doth grant, demise and to farm let, unto the said party of the second part that certain farm. [Here follows description of the farm to be let.]

To have and to hold the said demised premises for the term of three years, said term beginning March 1, 190.., and ending with the last day of February, 190..; then to be fully completed and ended unless previously terminated according to conditions hereinafter mentioned.

Yielding and paying as rent therefor to the said first party, his heirs, executors, administrators or assigns, the sum of Sixteen Hundred Eighty Dollars ($1680.00), according to the tenor and effect of six certain promissory notes, of even date herewith, due and payable as follows:

Number one, for $280.00 due Nov. 15th, 1903
Number two, for $280.00 due Feb. 15th, 1904
Number three, for $280.00 due Nov. 15th, 1904
Number four, for $280.00 due Feb. 15th, 1905

Number five, for $280.00 due Nov. 15th, 1905
Number six, for $280.00 due Feb. 15th, 1906

It is expressly stipulated and agreed, by and between the parties hereto, that on or before November 15th, of each year, during the continuance of this lease, the said second party, their heirs or assigns, will secure to the said party of the first part, his heirs or assigns, to the entire satisfaction of the latter, the payment of the above mentioned notes for the year's rent next succeeding the year in which said security is given.

The said second party covenants and agrees to cultivate the plow-land on said farm in a good farmer-like manner; not to grow any one kind of grain more than two successive seasons on the same piece of the plow-land without special permission of the first party; to keep at least 80 acres of the said demised premises, not including "orchard lot," house and barn yard, seeded down to grass for meadow and pasture; to "fall-plow" all the "stubble land" immediately after the grain is cut and before the weeds become grown rank on the same, except in the fall of the year 1904; to keep all hollows and ravines, on said farm, seeded down to grass to prevent washing thereof, and in case it should be discovered that a "wash" has commenced in any of said hollows or ravines said second party agrees to haul and place in such "wash" straw, manure, brush or whatever may be necessary to prevent further washing, and, after plowing or otherwise covering same with soil, to sow grass seed on the same, said seed to be furnished by the first party; to protect, trim and prune orchard and shade trees in a proper manner and as directed by the first party; to keep fences, buildings, wells, cisterns, windmill, pumps, tanks, and all other improvements on said premises in as good repair and condition as the same are now in, or may be put in, during said term, all free of charge to lessor except that lessor agrees to pay for new materials, should any be necessary; that they will not stable or confine or permit any livestock within any buildings on said premises not built or intended to be used for such purposes.

Should lessor decide to erect any buildings or fences or

make any improvements on said farm which will be for the use and benefit of the lessees, during said term, the said lessees hereby agree to haul all materials and otherwise assist to the extent of their ability; and should lessor, at any time, have men employed, making improvements on said premises who do not live in the immediate neighborhood, it is hereby agreed and understood that they shall be furnished, free of charge, with bed and board by said lessees.

After threshing the grain, said lessees agree to stack the straw in a proper manner and to have all straw and stalks which are raised thereon, fed out and converted into manure on said demised premises, no straw or stalks to be taken off the farm without special permission from the said lessor; lessees further agree to haul out and spread on said land, where most needed, all manure which is sufficiently rotted for fertilizing purposes.

Lessees further agree to take special pains to keep the buildings and yards clean and tidy, not allowing straw, manure or any other litter to be scattered around, thus making the premises present a better appearance and reducing the liability of accident on account of fire.

If at any time, the parties to this lease decide to seed down for use as pasture or meadow, any part of said premises, it is understood and agreed that the first party will pay for the grass seed decided necessary to do such seeding, and that the second party will, free of charge, perform the labor necessary in seeding down said land. In case lessees desire to break up any sod, either meadow or pasture, on said farm, which would thereby reduce the number of acres herein agreed to be kept under sod by said lessees, they hereby agree to seed down at their own expense for seed and labor, in a good farmer-like manner, as many acres of some other part of the plow-land as they have broken up of sod, and in the same year, all of such breaking and seeding to be done after obtaining permission of the lessor. The said lessees further agree to take extra pains to sow good clean seed on said farm; to keep the land clear of all obnoxious weeds and burrs, pulling and digging the same as required by law. Also, to work out or pay the highway tax

on said premises, at the proper time each year, free of charge to lessor and to deliver the overseer's receipt for same to the first party.

The second party agrees to pay the rent promptly at the time specified in the above mentioned rent notes; to deliver up possession of said premises peaceably and quietly and in as good repair and condition as the same are now in, or may be put in, reasonable use and ordinary wear and tear excepted, at the end of said term.

The first party expressly reserves, for himself or his agent, the right to enter said premises at any time, to view the same, to plant trees, erect buildings or fences or to make any improvements he may see fit, also for the purpose of plowing or hauling and spreading manure on any part of the premises, at any time after the grain is cut or the corn picked in the fall of the last year that the said second party, their heirs or assigns, put in a crop on said farm.

The first party reserves the right to sell the said demised premises, or any part thereof at any time in the term of this lease and the said lease shall terminate and become null and void on the first day of March next after such sale. The first party agrees that, in case of such termination of this lease, he will return to the second party all of the above mentioned rent notes which become due after said first day of March last above referred to.

This lease is understood and agreed to be not assignable by the said lessees.

In case of failure to perform or fulfill any of the covenants, conditions or agreements of this lease, to be done and performed by the said lessees, the said lessees will forfeit all rights under this lease, and the said lessor, his agent or assigns shall have full authority to re-enter said premises and oust said lessees, all notice under the statutes or otherwise being expressly waived; but in case the said lessees shall faithfully and punctually comply with all the covenants, conditions and agreements herein contained, on their part, they are to have peaceable and quiet enjoyment of said premises to the end of said term. Witness our hands, etc.

CHAPTER XIII

THE ADJUSTMENT OF THE RELATIONS BETWEEN LANDLORDS AND TENANTS IN ENGLAND

So long as a country has an abundant supply of productive land, and its agriculture is characterized by the extensive exploitation of the natural fertility of the soil, the adjustment of the relations between landlords and tenants is a comparatively simple matter. But when some of the elements of this original fertility have begun to show signs of exhaustion, or when the increasing demands of a growing population make it necessary that each acre of land shall yield a larger product, so that it becomes necessary to introduce a more intensive system of culture, involving investments which cannot be realized upon for several years, then it is that the tenant problem becomes a serious one.

The same progress which makes intensive farming necessary, tends also to augment the numbers of those who must hire the land which they cultivate. With the growth of population, competition for the use of land becomes more and more keen and drives the price of land higher and higher. This makes it ever more and more diffi-

cult for the succeeding generations of farmers to acquire the ownership of land. Hence with the progress of society the tenant problem becomes more general as well as more difficult to solve.

England is preëminently the land of tenant farmers. Less than fourteen per cent. of the farm land of that country is reported as operated by its owners, and in most cases such land is operated by hired farmers, or bailiffs as they are called. About eighty-six per cent. of the farm land of England is operated by tenants who pay a fixed rent for its use. Share tenancy is not practised in England.

It was more than a century ago that the progress of English industrial society had reached the stage of development where intensive agriculture was socially desirable, and also profitable to the farmers where their relations to the land were so adjusted as to guarantee to them just returns upon their investments. The earliest attempts at improving the agriculture of the country at once brought forward the tenant problem. In 1649, Walter Blith wrote:[1] "If a tenant be at ever so great pains or cost for improving of his land, he doth thereby but occasion a great rack upon himself, or else invest his landlord with his cost and labor gratis, or at best lies at his landlord's mercy for requital, which occasions a neglect of good

[1] Thorold Rogers, *Work and Wages*, pp. 458-459.

husbandry to his own, the land, the landlord, and the kingdom's suffering."

For more than a century the rural economists of England have been trying to solve this problem. Hence it is in England that the tenant problem can best be studied in the light of history.

Prior to the introduction of the *new agriculture,* which movement became important during the latter half of the Eighteenth Century, the tenant farmers of England usually held their lands "at will," without any written agreements. Under this tenure, the common law and the customs of the estates formed the only tie between owners and tenants, and either party could bring the tenancy to a close, by giving six months' notice to the other.[1] Towards the close of the Eighteenth Century, it became a common custom, where land was held from year to year, to draw up legal agreements, by which the tenants bound themselves "to the fulfillment of certain clauses and conditions."[2] But the most significant movement of this period was that in favor of leases for a term of years. The rural economists of that time were quite generally of the opinion that long leases were necessary wherever the farmers were expected to make investments in or upon the land, such as require several years to yield their full

[1] Loudon, *Encyclopedia of Agriculture,* p. 764; also, W. Marshall, *Landed Estates,* 1806, p. 378.

[2] H. E. Strickland, *Agricultural Survey of the East Riding of Yorkshire.*

return. It was stated in 1799, that the improvements which had taken place in England prior to that time had been almost entirely due to the custom of granting twenty-one year leases, and that where it was uncommon to grant leases for long periods of years, agriculture remained in a backward condition.[1]

During the early years of the Nineteenth Century the English Board of Agriculture published a series of surveys which set forth the conditions of agriculture in every county of the kingdom. This material, supplemented by the other agricultural writings of the time, makes it possible to present, in considerable detail, the history of the attempts to solve the tenant problem in England by the introduction of long leases.

From these surveys it appears that the greater part of the tenant farmers of England one hundred years ago held their farms "at will," without written agreements, or "from year to year" under written agreements. In either case they might be thrown out of the possession of their farms on six months' notice, at the pleasure of the landlord. But while this was the dominant form of land tenure throughout the greater part of England, the use of long-term leases had greatly increased during the latter part of the Eighteenth Century, and leases varying in duration from three to

[1] Brown, *Agricultural Survey of West Riding of Yorkshire*, p. 30; also, Arthur Young, *Survey of Norfolk*, p. 47.

twenty-one years were found in every county. Twenty-one-year leases were much used in the eastern counties, and leases running from seven to fourteen years were quite common in the western and southern counties. The county of Norfolk, the home of the *new agriculture,* was preëminently the land of long leases. Arthur Young wrote of this county: "The great improvements which for seventy years past have rendered Norfolk famous for its husbandry, were effected by means of twenty-one-year leases, a circumstance which very fortunately took place on the first attempt to break up the heaths and warrens in the northwestern part of the county. . . . In general it may be held for sound doctrine in Norfolk, that an estate can neither be improved, nor even held to its former state of improvement, without long leases."[1] This view was held, also, by that most competent agricultural writer of the time, William Marshall,[2] who wrote as follows on this same subject, in 1795: "Marling is the principal improvement of a Norfolk farm, but who would marl on a seven years' lease? Where much marling is to be done, fourteen years is too short a term."

In some places, it is true, the old and simple system of holding land from year to year was thought to be entirely satisfactory. It was reported that great estates were let in full confidence

[1] *Survey,* p. 47.
[2] *Rural Economy of Norfolk,* Vol. I, p. 68.

without leases in the East Riding of Yorkshire, "where a lease was never asked for, probably never wished for," because the tenants were "equally secure" when holding their farms from year to year.[1] In Staffordshire the conditions were much the same.[2] In Derbyshire, the Duke of Devonshire granted no leases, "but owing to his fair treatment of tenants" improvements were carried on extensively; but the other landlords of the county were not able to inspire such confidence.[3] Arthur Young, who was the champion of long leases, laid down the general rule, that upon rich soils where no improvements are necessary, "the want of leases cannot be material; but where liming, marling, draining, fencing, etc., are demanded, the want of a lease will often be the want of the improvements."[4]

But while "tenancy at will" or "from year to year" was quite satisfactory where no improvements were to be made, or where the landlords were able to win the confidence of their tenants, the surveyors reported quite generally that the security of long leases was necessary to induce the farmers to carry on the needed improvements. In remarking upon the lack of security to the investments of tenants in England, at that time, James Anderson says "an unprejudiced person,

[1] *Survey*, p. 72.
[2] *Ibid.*, p. 31.
[3] *Ibid.*, p. 35.
[4] *Ibid., Lincolnshire*, pp. 57-60.

who should attentively consider the whole system of conduct pursued by landed proprietors, and the ideas that in general prevail in this respect, would believe that agriculture was an employment which it was deemed to be a good policy to repress above all others."[1]

John Tuke, who for many reasons favored the letting of land from year to year, says in his report on the North Riding of Yorkshire: "Experience, nevertheless, teaches us, that under some landlords, especially those in straitened circumstances, ... or where considerable improvements are to be made at the expense of the tenants, it is more advisable to be under greater certainty, though attended with greater rent."[2] The desirability of increasing the number of twenty-one-year leases in the West Riding of Yorkshire was stated very forcibly by Robert Brown, who believed that without long-term leases improvements could not be made.[3] In Derbyshire improvements were thought to be much retarded because the tenants lacked the security of long term leases.[4] In Lincolnshire, where leases for a term of years were very rare, it was generally believed that, while improvements had been carried forward fairly well, long-term leases would result in much greater improve-

[1] *Agriculture,* Vol. 3, p. 92.
[2] *Survey,* p. 55.
[3] *Ibid.,* p. 30.
[4] *Ibid.,* Vol. III, p. 638.

ment.[1] In Leicestershire, the yeomen farmers were improving their lands, but the tenant farmers were slow to make improvements owing to the lack of long-term leases. It was said that while in many cases the present landlords could be trusted by the farmers, the estates might change hands at any time and that a new lord usually meant a different ordering of affairs. The phrase, "New lords, new laws," was current in Leicestershire.[2] In 1784, William Marshall was of the opinion that, in the midland counties, it was of little importance whether land was held under a lease for a term of years, or from year to year,—such was the confidence of the tenantry in the landlords. An instance is given of a young man who held a large farm from year to year, and who proceeded to improve the land in various ways. Five years later the following note was added to the earlier statement: "Unfortunately for the tenant, in this instance, his farm is now on sale, and the very expensive improvements which he has been making, are, probably, in a great measure sunk."[3]

It was thought that farmers would be more enterprising in Shropshire, if more leases were granted.[4] In Worcestershire, it was believed, both by the landlords and by the tenants,

[1] *Survey*, p. 57.
[2] *Ibid.*, p. 341.
[3] *Rural Economy of the Midland Counties*, Vol. II, p. 52.
[4] *Survey*, p. 137.

that, where improvements were to be made, a lease for a term of years was necessary.[1] John Friest, the author of the Buckinghamshire Survey, made a plea for long leases, especially where improvements were to be made.[2] In Cambridgeshire, where most of the farms were held on yearly tenures the lack of certainty of tenure was much felt.[3] In general the tendency was for the tenant farmers who held their farms from year to year, to adhere to the old customs and to attempt no new improvements; for the saying:

> He that havocs may sit,
> He that improves must flit,

expressed a common belief among the tenant farmers of that day who held their land from year to year.[4] The farmers and the rural economists of the time were quite generally agreed that the adoption of long-term leases throughout the land was essential to the introduction of the desired improvements in agriculture.[5]

The long-term lease of one hundred years ago reached its highest degree of perfection in the county of Norfolk.[6] The two main objects to be secured by the covenants of the lease were: first, to guarantee to the tenant the continued posses-

[1] *Survey*, p. 38.
[2] *Ibid.*, p. 83.
[3] *Ibid.*, p. 38.
[4] R. E. Prothero, *English Farming*, p. 58.
[5] *Hunter's Georgical Essays*, (1804), Vol. 6, Essay XXXVI.
[6] See Appendix to Chapter XIII, for Marshall's description of the Norfolk lease.

sion of the farm for a period sufficiently long to encourage investments in improvements, especially such improvements as are made in and upon the soil by careful tilth and by the addition of artificial fertilizers, and second, to secure the landlord against improper use of the property during the last few years of the tenancy so that the farm would be returned to the landlord in good condition. "No department of the management of an estate gives more uneasiness to both landlord and tenant," says Marshall, "than do *removals,* or exchanges of tenants; and every covenant which facilitates this unpleasant business is valuable."[1]

In the Norfolk leases the greater number of the covenants which restrict the farmer in his operations, pertain to the last three years of the tenancy. This was true to a greater or less extent in the other counties where long term leases were in use. This method of laying down restrictions seems to have been based on the belief that the interest of the tenant would lead him to farm in accordance with the rules of good husbandry until the last few years of the tenancy, at which time he could increase his own profits by exhausting the soil and leaving the farm in bad condition for the incoming tenant.

We wish to call especial attention to a covenant given by Marshall as found in the Norfolk

[1] *Rural Economy of Norfolk,* second edition, Vol. I, p. 69.

leases, which forbids the taking of more than two grain crops without a whole year's fallow, a crop of turnips, or "a two years' lay." Writing nine years later than Marshall (1804), Arthur Young gives the following clause among "new covenants" in use in the county of Norfolk. The tenant "shall not sow any of the lands with two successive crops of corn, grain, pulse, rape or turnips for seed,"[1] without the consent of the landlord. The rule that two grain crops should not be grown in succession on the same piece of land became an established custom in most of the grain-growing districts of England. This rule was in harmony with the Norfolk four-course system of crop rotation. In this four-course system, a fallow crop, that is a cultivated crop, usually a root crop, is followed by a crop of spring grain with which clover or grass seeds are sown. After harvesting the hay the next season, the field is plowed and put into condition for fall grain which is the fourth crop in the course. For more than a century this system has been the most highly approved of all systems of crop rotation in use in England. This same system was introduced into Germany by Albrecht Thaer.

A study of the leases in use in the various counties of England at the close of the Eighteenth Century, does not give so favorable an impression as do the descriptions of the Norfolk system.

[1] *Agriculture of Norfolk*, p. 50.

The limitations and restrictions as to the crops which could be grown, and as to the system of crop rotation, were often of such a character as to make them injurious to the interests of the farmers. These regulations were likely to be of such a character as would make it impossible for the farmers to adjust their farming to the demands of the times. In the Vale of Gloucester, for example, where nearly all of the land was as yet in the common fields, the tenants were required "to fallow the arable land, every third or fourth year; according to the established course of husbandry of the township." And again, "not to sow hemp, flax, or rape seed on any part of the premises. Nor, otherwise, to cross-crop; but to sow the same corn and grain, from year to year, according to the best and most usual course of husbandry used in the respective townships."[1]

In writing on the subject of the restricting clauses, generally found in the leases of his time, Robert Brown says: "The restrictions imposed during the time he occupies his farm, prevent the farmer from changing his management, or of adapting his crops to the nature of the soil he possesses. Agriculture is a living science which is progressively improving, consequently what may be esteemed a good course of cropping at one time, may, from experience and observation, be

[1] W. Marshall, *Rural Economy of Gloucestershire*, Vol. I, p. 25.

afterwards found defective and erroneous. That particular covenants in a lease are obstacles to improvements cannot be disputed; for the very nature of a covenant supposes that the practise to be regulated by it had arrived at its *ne plus ultra,* and could not be mended. These covenants or restrictions subsist more or less in every lease we heard of; and the shorter the lease the more numerous they are. . . . General rules of management are very proper in leases, such as, to keep the farm in good order, to consume all the straw raised upon it, and to sell no dung. These restrictions we will allow; and every good farmer will follow them whether he is bound to do so or not. Nay, we will go farther—if leases of a proper duration were granted, it is very reasonable that the property of the landlord should be protected by restricting clauses for the three years previous to their expiration. But after all, it will be found that no clause can be inserted, besides the general ones already mentioned, that will serve to enhance the value of the land, except obliging the farmer to leave a proportional quantity of such land in grass at the expiration of the lease, and specifying the manner in which that land is to be sown down. Other clauses serve only to distress the farmer, but will never promote the interests of the landlord."[1]

All the agricultural writers of the time were by

[1] *Agricultural Survey, W. R. Yorkshire,* pp. 42-44.

no means in full agreement with Robert Brown in his views on the subject of leases. Leases seem to have been in best repute in the eastern counties, where they were usually for a term of twenty-one years. Mr. Bailey is quoted as saying, in criticism of Mr. Brown's position as stated above, that, "if the proprietors of land were sure of always getting tenants that would act properly there would be no need of restricting covenants; but this is not always the case, and there are many instances of estates being much injured by exhausting crops where tenants were not properly restricted. That many covenants are useless or hurtful I readily admit; but covenants may be so framed, that a tenant shall have ample liberty to take such crops as he shall think proper, and to propose such modes as shall benefit himself without injuring his landlord."[1]

It was quite generally agreed that long leases properly drawn, were extremely desirable from the standpoint of the farmer, wherever improvements were to be made. But the landlords were not so generally of the opinion that long term leases were a good thing. Many landlords claimed that it made the tenants too independent.[2] But a more important objection was found in the fact that while a lease of sufficient

[1] *Agricultural Survey, W. R. Yorkshire*, p. 50.
[2] *Staffordshire, Survey*, p. 30; *Leicestershire Survey*, pp. 51-52; *Northamptonshire Survey*, p. 45.

length would enable the tenant to make improvements, it was hard to arrange matters so that the tenants would not exhaust the land at the end of the tenancy. It often happened that a tenant would bring the land into good tilth and to a high degree of fertility during the early years of his tenancy, and then take as nearly everything out of it as possible during the last few years of the lease.

Another objection to the granting of leases for long terms became quite general between 1790 and 1815. The landlords objected that as a result of rising prices during the period covered by the leases, they sustained great losses. It was maintained by the landlords of Surrey, for example, that by letting land for a term of fourteen or twenty-one years or any longer period, the owners of the land actually received, "almost every year during the currency of the lease, and certainly in the latter years of it, a less rent than he did at the commencement, from the depreciation in the value of money."[1] And for this reason the landlords were objecting to the granting of leases. Even in the county of Norfolk, where the twenty-one year lease had proved so beneficial, the landlords objected to long leases because it so often happened that soon after a farm was rented the prices of agricultural produce would rise so much higher than when the lease was taken, that the

[1] W. Stevenson, *Agriculture of Surrey*, p. 98.

tenants were "under-rented" for a series of years.[1] The basis for complaint on this ground is shown by the fact that the average price of wheat was about twice as high for the five years from 1809 to 1813 as for the five years from 1790 to 1794.[2]

A statement of the tenant problem and the solution proposed by an eminent rural economist of the time will be interesting in this connection. In his work on Landed Estates, published in 1806, William Marshall reviews the existing forms of land tenure.[3] "The tenant holding *at will*"; "holding from *year to year,* under a written agreement, with specified covenants"; "leases for a term of years, as seven, fourteen, twenty-one, or greater number of years"; and says:

> Objections are urged against each of these species of tenancy. The depreciation of the circulating value of money, and the consequent nominal rise, in the rental value of lands, has rendered long leases greatly disadvantageous to proprietors: while annual holdings are not only discouraging to tenants;—especially to men of exertion and capital —but are a bar to the improvement, and a clog on the prosperity of an estate: beside being, in the first instance, unfriendly to the interests of proprietors; inasmuch as they lower the fair rental values of their lands.
>
> Some years ago, on perceiving the antipathy which had gone forth among men of fortune, against granting leases for long terms, and being well aware of the disadvantages of annual holdings, it occurred to me that agreements for occupying from *three years to three years,* instead of from year to year, would be an eligible species of tenancy:—or,

[1] Marshall, *Rural Economy of Norfolk,* Vol. I, p. 67.
[2] Prothero, *English Agriculture,* Appendix I.
[3] Pp. 378 to 382.

which is the same thing, granting leases for six years certain; with a condition that if neither party give notice to quit, before the expiration of the first three years, then the term to be prolonged to nine years; and so on, from three years to three years . . . . until three years after notice has been duly given, by either party to the other.

This gives room for a tenant "to turn his hand in," and a loose to his exertions. He has, in reality, a fresh lease of six years granted him, every third year. This is sufficient to encourage him to keep his lands, continually, in a husbandlike state. And if he execute at his own expense, any of the higher improvements, such as [improving waste lands, etc.] it is but reasonable that he should have, whenever he may quit his farm, an equitable remuneration for the *remainder* of such improvements. Thus, the tenant is placed on sure ground. He may till, manure, and improve, with much the same confidence, as if the lands in his occupation were his own property.

In return for such advantages, the tenant cannot refuse to covenant, that, during the last three years of his term, he will manage his farm in a husbandlike manner, and, at the end of the term, will leave it in such a state of cultivation and repair, as will induce a good tenant to take it, at a full rent;—or suffer the proprietor to put it in such a state, at his (the outgoing tenant's) expense.

An estate which is under lease, on these principles, and under attentive management, cannot be let down to an unprofitable state. It must continually remain under a regular course of husbandry, and in a state of cultivation and repair. If the acting manager do his duty, even the changing of tenants cannot interrupt its prosperity. The incoming tenant (under attentive management) steps into his farm, with the advantages that he would have enjoyed, had it been under his own direction for the three preceding years.

But, with a lease on this principle, and with a proper choice of tenants, removals can rarely happen. What superintendent, who knows the difficulty of procuring a good tenant, would wish to discharge him? And no such tenant

will readily leave the farm he is settled upon, if he find proper treatment. Even should notice be given, in consequence of any misunderstanding between the parties, three years allow time for reflection; and, before they expire, resentment may die away, and cordiality be restored. If, however, either party remain dissatisfied, he has an easy way of dissolving the connection. Or if a proprietor or a superintendent is desirous to make fresh arrangements on an estate; or to regulate its rent roll, by the existing value of money; he need not wait many years to fulfill his desire. For if the tenant in occupancy will not agree to pay a fair rent, he has three years before him to choose one who will; —another valuable advantage of the tenancy proposed.

Thus, a lease on this principle has a decided preference by a proprietor, to long leases. And its advantage over annual holdings is not less considerable. The lands of an estate are well worth from five to ten per cent. more, to a tenant, under the former, than under the latter, tenancy. So that, beside the conveniences mentioned, a proprietor may be immediately adding very considerably to his income, by this principle of management.

This species of tenancy I have had the happiness of being the means of introducing, upon some considerable estates, in England, in Wales, and in Scotland; with, I believe, the mutual satisfaction of the men of fortune who possess them, and of their tenants.

While this system proposed by Marshall might solve the problem of adjusting the amount of rent to changes in real rental values, and while it might encourage the tenant to make such improvements as he could realize upon in three years, it had laid down no scheme for determining the value of unexhausted improvements, and, indeed, does not even propose that a tenant shall have remuneration for the investments made

upon the land during the last three years, and on which, if he farms in a husbandlike manner, he cannot realize all of the benefit. Thus it seems that Marshall failed to solve the most permanent difficulty which the tenant problem presented; for the unsettled condition of the money market became less important in the course of time, while the problem of unexhausted improvements has been of increasing importance as the years have gone by.

Various methods were devised, in different parts of England, for keeping the tenants from leaving the land in an exhausted condition at the termination of their leases. It was the custom on one estate in Shropshire to lease the land for twenty-one years "certain," and for seven years more at the option of the landlord. At the end of the twenty-one-year period, a new contract of the same kind might be entered into, if terms could be agreed upon, or the tenancy might be brought to a close, but the important condition was that if the tenant had reduced the land to a very low degree of fertility he could be forced to keep the farm for seven years longer at the old rent. Even if this system had succeeded in protecting the landlord, it failed even to recognize the right of the tenant to unexhausted improvements.

The system which subsequent history has shown to be the most effective means of keeping

the farmers from exhausting the land during the last few years of the tenancy, is that reported in the Yorkshire Survey. The system was that of granting remuneration to the retiring tenant for all his investments on which time had not yet allowed him to realize their full returns; the tenant was then left free to farm as he pleased so long as he conformed to the rules of good husbandry. One of the examples of this system is as follows:

The landlord covenants to allow the tenant, on quitting his farm, what two indifferent persons shall deem reasonable, for what is generally called full tillage and half tillage, being for the rent and assessment of his fallow ground, the plowing and the management of the same; the lime, manure, or other tillage laid thereon; the seed sown thereupon; the sowing and harrowing thereof; also for the sowing, harrowing, manuring, and managing any turnip fallow which he may leave unsown; also for any clover seed sown on the premises; and harrowing and rolling in of such seed; and for every other matter and thing done and performed in a husbandrylike manner on such fallow lands, in the two last years of the term; also for the last year's manure left upon the premises; and for any manure and tillage laid upon the grass land.[1]

During the period of rising prices prior to 1812, the farmers were anxious to rent land on long leases. It is said that at that time, "good tenants always wanted leases," that "they were galloping after one another to take leases at any rent."[2] After the close of the Napoleonic wars,

[1] *W. R. Yorkshire*, p. 40.

[2] *Parliamentary Papers*, 1833, Vol. V, questions 7420 and 8462.

prices fell back almost to their old level. The average price of wheat was just about half as high for the five years from 1821 to 1825, as for the five years from 1809 to 1813. With this fall in prices the farmers became even more averse to the taking of long leases than the landlords had previously been. One after another the witnesses before the Parliamentary Committee on Agriculture, in 1833, bore testimony to the fact that the farmers were objecting seriously to taking long leases, because they did not know how soon they might be unable to pay the rent, as their capacity to pay the rent depended upon such uncertain prices. The farmers were in doubt as to how much protection they were to have from the competition of foreign producers. But without regard to this, they knew that the prices of agricultural products had been falling for several years in succession and they were unable to tell when the limit would be reached.

With depressed prices the landlords found new reasons for objecting to long leases. This was the time, one might think, for the landlords to regain what they had lost during the period of rising prices, but they found it rarely happened that the tenants were able to stand the losses incurred by falling prices. The farmer could not be forced to live up to his contract, if he was losing money. It was said that leases were binding upon the landlords but not upon the tenants.

The fall in prices seemed to demoralize the farmers, so that the landlord was never certain that his tenant would not disregard the contract in case of a fall in prices, whereas the tenant would certainly remain to reap the benefits in case of a rise in prices.

The remedy which was often prescribed for the evils of fluctuating prices, was the introduction of "corn rents."[1] By this it is not meant that the farmer was to give a certain share of his crop to the landlord as rent, but that he should pay as rent the value of a certain fixed amount of grain. The rent was figured on the basis of what was called in Scotland the "fiars prices of the county." In Scotland the sheriff of each county was bound to summon a jury once each year to examine on oath, a number of witnesses, such as farmers, grain dealers, brewers, etc., and according to the evidence thus obtained, to fix the "fiars prices" of the different grades of grain. This system was quite generally resorted to in Scotland during the period of falling prices. Corn rents were advocated by the English rural economists of the time, and were introduced with success in a few instances in the western counties; but this system failed to gain general favor among the farmers and landlords of England.[2]

[1] *Parliamentary Papers*, 1833, Vol. V, question 2594-96; 2601-2609.

[2] *Ibid.*, questions 328 to 331; 347; 10438; 10448; 10454; 10591-95.

The use of long leases declined rapidly in England during the period following the close of the continental wars. In those counties where they had been most numerous and most beneficial, the farmers came to prefer short leases or even tenancy from year to year. The long lease as a means of solving the tenant problem had been "weighed in the balances and found wanting." Yet it must be admitted that long leases had done a great deal of good in promoting improvements in English agriculture and now that the prices of agricultural products were depressed the farmers did not find it profitable to farm their lands so intensively as formerly even if they had long term leases. Thus, the tenant problem was of less importance in the minds of the farmers for a series of years, until the return of prosperity again raised the question of investments in improvements and the means of securing just returns upon such investments.

The period from 1836 to 1875 was one of general prosperity for English farmers, and by 1850 the tenant problem was receiving the attention of Parliament. The use of long leases had gradually declined during the first half of the Nineteenth Century, and while there were agricultural economists who still advocated this means of securing to the farmers legitimate returns upon their investments, there was a very prevalent dislike to long leases on the part of both parties con-

cerned. Yet it was generally recognized that security to the tenant's investments was essential to the promotion of that degree of intensity of culture which was most profitable in the long run both to the tenant and to the landlord.[1]

The long period lease had proved so unsatisfactory that especial attention was now given to the perfecting of the "year to year" agreement. The custom of "tenant-right," which had proved satisfactory in Lincolnshire, formed the basis for the hope that tenants holding their farms from year to year might be given that degree of security which would promote good agriculture.

The introduction of agricultural improvements came rather later in Lincolnshire than in many other parts of England, but when the transition did come it was "rapid and striking, perhaps more so than in any other county in England."[2] These improvements were made, too, without the protection of long time leases. They were made under the protection of the Lincolnshire system of tenant-right. "It was very fortunate," says Caird, "that when the time for [the introduction of agricultural improvements] arrived, the lead-

[1] To avoid the necessity of making specific references in great numbers it will simply be stated that the discussion of this period is based upon a Parliamentary Report on Agricultural Customs, *Parliamentary Papers*, 1847-8, Vol. VII; and Caird's *English Agriculture* in 1850 and 1851. In these sources the material here used is indexed under "tenant-right."

[2] Caird, *English Agriculture*, p. 194.

ing landlords [of Lincolnshire] were liberal and intelligent men. . . . They saw the advantage of encouraging tenants to embark their capital freely; and as leases were not the fashion of the county, they gave them that security for their invested capital, which is termed 'tenant-right,' or compensation for unexhausted improvements. Though this tenant-right may not be a strictly legal claim, it is universally admitted in Lincolnshire, the landlord paying it when a farm falls into his own hands, and refusing to accept a tenant who declines to comply with the custom. It varies, however, considerably in the different parts of the county, and appears to have enlarged in its obligations with the greater development of agricultural improvements. In North Lincolnshire, the usual allowances claimed by the outgoing from the incoming tenant, include draining, marling, chalking, claying, lime, bone, guano, rape dust and oil-cake. The following is the scale on which these allowances are usually made:

When the landlord has found tiles, and the tenant has done the labor, if done within twelve months before the end of the tenancy and no crop has been taken from land after the draining thereof is completed the whole cost is allowed. If one crop has been taken from such land, three-fourths of the cost are allowed, and so on, diminishing the allowance by one-fourth for each crop taken; but this allowance is made only when the work is well and properly done by the tenant, to the satisfaction of the landlord or his agent, expressed in writing. For marling or chalking, if done within twelve months before the end of the tenancy, the whole

cost is allowed; for that done in the previous year, seven-eighths of the cost are allowed; and so on, diminishing the allowance by one-eighth for each year that shall have elapsed since the marling or chalking.—For lime used within twelve months before the end of the tenancy, if no crop has been taken from the land limed in that year, the whole cost, including labor, is allowed; if one crop has been taken from such land, four-fifths of the cost are allowed; and so on, diminishing the allowance by one-fifth for each crop taken from such land.—For claying on light land, a similar allowance to that for lime.—For bones used within twelve months before the end of the tenancy two-thirds of the cost are allowed, and for those used in the previous year one-third of the cost.—For guano and rape dust used within twelve months before the end of the tenancy for turnips or other green crop, two-thirds of the cost are allowed.—For oil-cake given to cattle and sheep one-third of the cost price of that so used within twelve months before the end of the tenancy, and one-sixth of the cost price of that so used in the previous year is allowed.

"The amount of these allowances is settled by arbitration. . . . On the whole, ... the system is believed to have worked well."[1]

The custom of tenant-right was fully recognized in the counties of Sussex, Surrey, and Lincoln, in the Weald of Kent, in the northern part of Nottinghamshire, and in the West Riding of Yorkshire. In some of these regions the system was not giving very good results. In Surrey, the custom of tenant-right was said to be "promoting an extensive system of fraud and falsehood among the farmers."[1] The custom seems to have been quite loosely formulated in that county, and

[1] Caird's *English Agriculture in 1850 and 1851*, pp. 194-5.

it was possible for the farmers to "work up a quitting," as it was called,[1] and thus defraud the landlord or the succeeding tenant. Not being properly regulated the "compensation" often embraced "large payments for imaginary improvements and alleged operations, which, even if they had ever been performed would be more injurious than beneficial."[2]

But while the custom of tenant-right was very imperfect in its operations in some parts of England, the principle on which it was based was sound, and in time it was to be embodied in the laws of the land. The custom of tenant-right struck at the very heart of the tenant problem. It guaranteed to the tenant just returns for his investments, without involving the many disadvantages of the long-period lease. The experience of the landlords and tenants of Lincolnshire had already proved that where the system was properly regulated the custom of tenant-right was satisfactory in practise as well as sound in principle.

In 1850, a bill was introduced into Parliament which aimed at the embodiment of this custom of tenant-right into a law. It was entitled "A Bill for the Improvement of the Relation between Landlord and Tenant in England and Wales." Its purpose, as stated in the preamble, was to

[1] *Cairnes's English Agriculture in 1850 and 1851*, p. 119.
[2] *Ibid.*, p. 119.

insure to farmers, compensation for properly constructed, permanent improvements. The idea of enacting a law of this kind was not new in 1850. Two hundred years before, Walter Blith advised that a law be enacted "whereby every landlord should be obliged ..... to give him [the tenant] reasonable allowance for his clear improvements."[1] The bill of 1850 did not pass, but neither did it die. Again and again similar bills were brought before Parliament, and in 1875 an act was passed, which laid down the conditions for compensating the outgoing tenant, but unfortunately no provision was then made to keep the landlords from requiring the tenants to contract themselves out of the right to claim compensation under the law, and while the law was beneficial in that it systematized and brought greater uniformity into the practise of granting compensation where tenant-right was recognized, it was not generally adopted. The author of the bill, even, asked his tenants to contract themselves out of the benefits of the law which he himself had framed.

In 1883, a new bill, the Agricultural Holdings Act, was passed. This Act contained a clause making it illegal for a landlord to contract himself out of the conditions of the law. The law of 1883 with the slight modifications of the Amending Act of 1900, is still in force, and it will be worth while to examine it with considerable care.

[1] Thorald Rogers, *Work and Wages*, p. 459.

The law enables the tenant farmers to obtain from the landlords as compensation for improvements at the termination of their tenancies, "such sum as fairly represents the value of the improvement to an incoming tenant."

The improvements for which compensation could be claimed under this law were divided into three classes. The first class includes all those improvements to which the consent of the landlord is required if the payment of compensation is to be enforced by law. This class includes the following list of improvements:

(1) Erection or enlargement of buildings.
(2) Formation of silos.
(3) Laying down of permanent pasture.
(4) Making and planting of osier beds.
(5) Making of water meadows or works of irrigation.
(6) Making of gardens.
(7) Making or improving of roads or bridges.
(8) Making or improving of water courses, ponds, wells or reservoirs, or of works for the application of water power or for supply of water for agricultural or domestic purposes.
(9) Making or removal of permanent fences.
(10) Planting of hops.
(11) Planting of orchards, or fruit bushes.
(12) Protecting young fruit trees.
(13) Reclaiming of waste land.
(14) Warping or weiring of land.
(15) Embankments and sluices against floods.
(16) The erection of wirework in hop gardens.

[N. B.—The above are subject to the provisions given under the third class of improvements with respect to market gardens.]

The drainage of land is put into a class by itself. It is required that the tenant shall *give notice* to the landlord of his intention to construct a drainage system if he is to expect compensation under the law for his improvement. This notice must be given not more than three months nor less than two months before the beginning of the execution of the work, and during this time the landlord may, if the tenant has not in the meantime withdrawn the notice, "undertake to execute the improvement himself, and may execute the same in any reasonable and proper manner which he thinks fit, and charge the tenant with a sum not exceeding five pounds per centum per annum on the outlay incurred in executing the improvement, or not exceeding such annual sum payable for a period of twenty-five years as will repay such outlay in the said period, with interest at the rate of three per centum per annum, such annual sum to be recoverable as rent. In default of any such . . . . undertaking, and also in the event of the landlord failing to comply with his undertaking within a reasonable time, the tenant may execute the improvement himself, and shall in respect thereof be entitled to compensation" under the Agricultural Holdings Act.

The third class includes a large number of improvements for which compensation can be claimed under the law, without having gained the consent of the landlord or having given notice to

him previous to the execution of such improvements. The list of improvements put into this class is as follows:

(18) Chalking land.
(19) Clay burning.
(20) Claying of land, or spreading blaes upon land.
(21) Liming of land.
(22) Marling of land.
(23) Application to land of purchased artificial or other purchased manure.
(24) Consumption on the holding by cattle, sheep, or pigs, or by horses other than those regularly employed on the holding of corn, cake, or other feeding-stuffs not produced upon the holding.
(25) Consumption on the holding by cattle, sheep, or pigs, or by horses other than those regularly employed on the holding, of corn proved by satisfactory evidence to have been produced and consumed on the holding.
(26) Laying down temporary pasture with clover, grass, lucerne, sainfoin, or other seeds sown more than two years prior to the determination of the tenancy.
(27) In the case of market gardens—

(i) Planting of standard or other fruit trees permanently set out;

(ii) Planting of fruit bushes permanently set out;

(iii) Planting of strawberry plants;

(iv) Planting of asparagus, rhubarb, and other vegetable crops which continue productive for two or more years;

(v) Erection or enlargement of buildings for the purpose of the trade or business of a market gardener.

In ascertaining the amount of compensation payable to a tenant, account is taken of any benefit which the landlord has given or allowed to the

tenant for making the improvement. Also in case the tenant is under contract to return a certain amount of manure to the soil each year, and in case such amount shall not exceed the amount that is produced from the feeds which are produced upon the holding, this amount is excluded from the amount for which compensation can be claimed.

In case the landlord and the tenant fail to agree as to the amount of compensation which the tenant should have for the various improvements which have been named above, the difference is settled by means of arbitration.

In case of any breach of contract on the part of either landlord or tenant, damages may be claimed by the party injured. Also in case the tenant causes or allows any waste, injures the soil, or destroys the improvements, the landlord can make a claim for payment for such injuries. These claims are arbitrated the same as those for improvements.

In case of permanent improvements such as are not mentioned in either of the above classes, the tenant may remove the improvement unless the landlord may choose to buy the same, with the proviso that he repair any damages which may have been incurred by the removal of the building, that is he must leave the premises in as good condition as if the improvement had not been made.

It is the usual thing for the incoming tenant to pay the sum which is due the outgoing tenant as remuneration for improvements; and in case the new tenant remains but a short time on the farm, so that at the expiration of his tenancy he has not had time to realize in full upon such investments, he receives remuneration for such improvements just the same as if he had executed them himself.

These are the essential points of the Agricultural Holdings Act of 1883 as modified by the amending Act of 1900. The changes made by the amending Act were matters of detail meant to meet certain objections to the practical workings of the original Act. This law, as it now stands, seems to supply the regulations necessary to an amicable adjustment of the relations between landlord and tenant in England.

Tenancy from year to year is the rule in England to-day, and no question is raised as to the security of the landlord or of the tenant. Either party may bring the tenancy to a close at the expiration of any year, by giving proper notice. Under the act, twelve months' notice is required, but by special agreement between landlord and tenant the time may be changed to six months.[1]

Written contracts are generally used, but the

[1] The Agricultural Holdings Act as now in force may be found in convenient form in the *Journal of the Royal Agricultural Society of England, third series,* Vol. XI, Part III, 1900.

leading agriculturists of the country agree that such contracts should contain few restrictions upon the methods of farming, except that the farm shall be operated in accordance with the rules of good husbandry. Many of the written agreements now in use would, if strictly enforced, bind the tenants hand and foot; but as a matter of fact many of these covenants are recognized to be obsolete and others are "winked at" by the landlords. A study of the written agreements nominally in force at the present time would, in themselves, give a very erroneous idea of the actual relations between landlords and tenants.

The farmers and the landlords of England have quite generally come to recognize that liberty and honesty are essential to success in agriculture. The writer gradually gained the impression by coming in personal contact with farmers and landlords, or more often the agents of the latter, that accompanying the gradual perfecting of the Agricultural Holdings Act, there has been the growth of a sense of justice in the minds of both the landlords and the tenants. This sense of justice is all the more effective because it is accompanied by the belief that in farm management, whatever is beneficial to the farmer is likewise advantageous to the landlord.

The English method of regulating the relations between landlord and tenant is successful throughout Great Britain. The history of land tenure in

Scotland would prove very interesting and helpful. Leases of long duration, most commonly for nineteen or for twenty-one years, have been in general use in Scotland for more than a century. The system of "corn rents," already referred to, proved an effective means of adjusting rents to prices at the time when this problem was proving disastrous to the long term lease in England. At the present time the Agricultural Holdings Act of Scotland is practically the same as that in force in England. While it continues to be the custom among Scottish landlords and tenants to have long term leases drawn, it has become the common thing to include a clause which makes it possible for either the landlord or the tenant to bring the tenancy to a close at certain periods, as for example, at the end of the fifth, tenth or fifteenth year, or at the end of the second, fourth, sixth, etc., year, by giving proper notice to the other party. In effect, therefore, the long term lease is passing away, for the same object is now attained through the Agricultural Holdings Act.

In another connection the writer had occasion to publish the statement that, "the relation between landlord and tenant is very satisfactorily arranged, the farmers are, as a rule, contented with the present system, and the fields of England prove that landownership on the part of farmers is not essential to good agriculture." This statement has occasioned surprise on the part of some

American readers, but an eminent agriculturist of Great Britain, Mr. John Speir, says this statement "expresses briefly and concisely the position here." The writer had no thought of minimizing the importance of landownership on the part of farmers, but rather to emphasize that in spite of the fact that tenancy is the rule in that country, the agriculture of England is, in many ways, worthy of our emulation, and that this advanced position of English agriculture is due, in a great measure, to an excellent system of adjusting the relations between landlord and tenant.

That Americans may profit by the experience of their British cousins, should be evident from the foregoing pages. That they will be willing to draw upon the experience of the English, will scarcely be questioned. The Americans have become independent in thought and action, and have become leaders in nearly every line to which they have turned their attention, yet they have always been willing to accept all that is of value in the achievements of other countries, and we believe that as America has profited by the experience of the English in the development of factory legislation, so will she profit by a study of the English agrarian legislation.

APPENDIX TO CHAPTER XIII

Covenants Found in Norfolk Farm Leases, by W. Marshall

[The following description of the Norfolk leases is taken from the second edition of William Marshall's *Rural Economy of Norfolk* (1795), pp. 70 to 80.]

The following *heads of a lease* will place the general management of a Norfolk estate in a clear and comprehensive point of view. They are not, either in form or substance, copied, precisely, from the lease in use upon any particular estate; but exhibit, I believe, a pretty faithful outline of the modern Norfolk lease.

Landlord agrees, 1. To let certain specified premises, for a term and at a rent, previously agreed upon.

2. Also to put the buildings, gates, and fences in tenantable repair.

3. Also to furnish rough materials, and pay half the workmen's wages in keeping them in repair, during the term of the demise; willful or negligent damage excepted.

4. Also to furnish the premises with such ladders as may be wanted in doing repairs, or in preserving the buildings, in case of high winds, fire in chimneys, etc. (an excellent clause).

5. Also to furnish rough materials for keeping the gates, gate-posts, styles, etc., etc., in repair; or to furnish the materials ready cut out; tenant paying the usual price of labor for cutting out.

6. Also to pay half the expense of such shores and ditches as he, or his agent, shall direct to be made or renewed.

Landlord reserves, 1. All minerals, fossils, marls, clays; with liberty to work mines, quarries and pits, and to burn lime and bricks upon the premises; likewise to carry away such minerals, etc., etc.; excepting such marl, or clay, as may be wanted for the improvement of the farm.

2. Also, all timber trees, and other trees and woods, underwood and hedgewood; with liberty to fell, convert,

char, and carry off such timber or other woods; excepting such thorns and bushes as shall be set out by landlord, for making and repairing fences; provided the thorns, etc., so set out be cut in the winter months; excepting, however, out of this proviso, such few as may be wanted in the course of the summer months, for stopping accidental gaps.

3. Also, full liberty of planting timber trees in hedges, or on hedgebanks; with a power to take to himself, after twelve months' notice given, some certain number of acres of land for the purpose of raising timber trees, other trees, or underwood; allowing the tenant such yearly rent, etc., for the land so taken, as two arbitrators shall fix.

4. Also, a power of altering roads, and of inclosing commons, or waste lands, without the control of the tenant; to which intent, all common-right is usually reserved, *in form,* though seldom *in effect,* to the landord.

5. Also, the customary liberty to view the buildings, do repairs, and, consequently, to bring and lay materials.

6. Lastly, the right of sporting and destroying vermin.

Tenant agrees, 1. To pay the stipulated rent half-yearly; and within thirty days after it be due; under forfeiture of the lease; and further, to pay the last half-year's rent two months, or a longer time, before the expiration of the term.

2. Also, to do all carriage for repairs (within a specified distance); and to find all iron-work and nails; and to furnish wheat-straw for thatching; and to pay half the workmen's wages, and find them with small beer.

3. Also, to do all ditching, etc., set out by landlord (provided the quantity set out do not exceed one-tenth of the whole); and to pay half the workmen's wages, and find them in small beer; and to defend with hurdles, or otherwise, all such young hedges as shall be exposed, in spring and summer, to the browsings of pasturing stock.

4. Also, to make, or pay for making, such gates, etc., as shall be wanted upon the farm during the term of the demise; and to hew, or to pay for hewing, all necessary gateposts; and to put down and hang, in a workman-like manner, such gates and gateposts at his own sole expense; as

well as keep all the old gates on the premises in tenantable repair.

5. Also, not to assign over, nor in any other way, part with possession of his farm; but to make it his constant residence during the term of the lease. Nor to take any other farm; nor to purchase any lands adjoining, or intermixed with it; without the license and consent of landlord; under forfeiture of the lease.

6. Also, not to break up any meadow, pasture, or furze ground, under the penalty of ten pounds an acre a year. Nor to cut "flags," that is, turves, under fifty shillings a hundred.

7. Also, not to lop or top any timber tree, under the penalty of twenty pounds; nor other tree, under ten pounds; nor cut underwood or hedgewood (except as before excepted) under ten pounds a load. But, on the contrary, to preserve them from damage as much as may be; and, if damaged by others, to give every information in his power under the penalty of twenty pounds.

8. Also, not to take more than two crops of corn without a whole year's fallow,—a crop of turnips twice hoed,—or a two years' lay,—intervening, under the penalty of

9. Also, to consume on the premises all hay, straw, and other stover; and not to carry off, or suffer to be carried off, any part, under pretense of being tithe compounded for, or under any other pretense whatever, under the penalty of ten pounds, for every load carried off. . . . . .

10. Nor to carry off, nor to suffer to be carried off, any dung, muck, etc., under five pounds a load.

11. Nor to impair the foundations of the buildings round the dungyard, by scooping out the bottom of the yard too near the buildings; but to keep up a pathway three feet wide between the dungpit and the foundations (an excellent clause).

12. Also, not to stock any part of the premises with rabbits; but to endeavor, as much as may be to destroy them.

13. Also, *during the last two years of the lease,* not to take in any agistment stock.

14. Also, *in the last year,* not to suffer swine to go loose without being yoked and rung.

15. Also, *in the last year,* to permit landlord, or incoming tenant to sow grass seeds over the summer corn; and to harrow them in, gratis; and not to feed off the young grasses after harvest.

16. Also, *in the last year,* not to sow less than ..... acres of fallow, of, at least, three plowings and suitable harrowings, with two pints an acre of good, marketable, white-loaf turnip seed; and, in due time, to give the plants two hoeings (*or, if the crop miss, to give the fallow two extra plowings*) in a husbandlike manner; and, at the expiration of the term, to leave such turnips growing on the premises; free from wilful or neglectful injury; under the penalty of ..... pounds an acre.

17. Also, to permit the landlord or incoming tenant to begin, on or after the first day of July, *in the last year,* to break up the two years' lay (hereafter agreed to be left) for wheat fallow, or any other purpose; and to harrow, stir, and work the said fallows; and to carry and spread dung or other manure thereon, without molestation.

18. Also, *in the last year,* to permit landlord, or incoming tenant, to lay up hay, or other fodder, on the premises, and to protect it thereon.

19. Also, to lay up and leave upon the premises, *at the expiration of the lease,* all the hay of the last year (or of any preceding year, if unconsumed at the expiration of the term) except ..... loads, which tenant is allowed to carry off.

20. Also, to lay up, in the usual barns and rickyards, the last year's crops of corn; together with the tithe, if compounded for; and to thresh them out in proper season; and in such manner that the straw, chaff, and colder shall be injured as little as may be.

21. Also, *at the expiration of the term,* to leave no less than ..... acres of olland [meadow-land, literally old-land], of two years laying (including that which may have been broken up by landlord or incoming tenant) and which shall have been laid down in a husbandlike manner, after

turnips or a summer fallow, with not less than twelve pounds of clover, and half a peck of ray grass, seeds an acre ..... under the penalty of ..... pound an acre. Also not less than ..... acres of olland, of one year's laying, to be laid down as above specified, under the penalty of ..... pound an acre.

22. Also, *at the expiration of the term,* to leave all the yard manure, produced in the last year of the lease, piled up in a husbandlike manner, on the premises; excepting such part of it as may have been used for the turnip crop; and excepting such other part as may have been used by landlord, or incoming tenant, for wheat.

23. Also, *at the expiration of the term,* to leave the buildings, ladders, gates, fences, water-courses, etc., etc., in good and tenantable repair; landlord in this, as in every other case, performing his part as above agreed to. Also, upon such parts of an estate as lie near the residence of the owner, it is customary for the tenant to agree to furnish annually, a certain number of loads of straw, according to the size of his farm; also to do the carriage of a certain number of loads of coal; also to keep dogs, warn off sportsmen, and suffer them to be prosecuted in his name: remnants, these, of the ancient base tenures of soccage and villanage.

Tenant to be allowed, 1. The full value of all the hay left upon the premises, of the last year's growth, or of the growth of any preceding year; provided the quantity of old hay do not exceed ..... loads.

2. Also, the full value of the turnips left on the premises; or the accustomed price for the plowings, harrowings, and manuring; at his own option.

3. Also, the feedage of the lays broken up, by the landlord, or the incoming tenant, from the time of their being broken up until the expiration of the term the ensuing Michaelmas; also, for all damage arising in carrying on manure or otherwise.

4. Also, the feedage of the young clovers, from harvest to Michaelmas.

5. Also, the use of the barns and rickyards for summer corn until Mayday; and for winter corn until the first of July next ensuing.

6. Also, (by way of a consideration for the stover) the customary price for threshing and dressing the corn; the landlord, or incoming tenant, also carrying the same to market, gratis: provided the distance required to be carried does not exceed ..... miles, and the quantity required to be carried, at one journey, be not less than ..... coombs. [A coomb is equivalent to four bushels.]

All the above *allowances* to be referred to two arbitrators; one to be chosen by each party, in Michaelmas week; and the amount awarded to be immediately paid down by the landlord, or the incoming tenant.

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